

COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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ROBERT B. COOPER, P.O. Box 330, MANGONUI, FAR NORTH, (New Zealand)

SKY'S EXPANSION PLANS FOR 1995

CTD Interview with John Fellet September 22

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CTD for July (issue 94-07-10) 'hypothecated' the mechanics of a SKY Direct satellite to home service which would be technically feasible by mid 1995 using Ku band service facilities of Optus; their B3 satellite (launched into orbit late in August). Premature announcement of a direct to home (DTH) service by SKY is not in their best business interests; at the moment the 'wireless cable' service is facing a myriad of practical terrestrial delivery problems associated with the expansion of the network from 3 to 5 analogue service channels.

In an interview with SKY's John Fellet conducted in their Auckland office over a 2 hour and 15 minute session late on the 22nd of September, Fellet would neither confirm nor deny his planning of a DTH service for New Zealand. He did go 'on record' as being a serious student of DTH delivery, and as you will see, has a well thought-out 'game plan' for serving those portions of New Zealand not presently reached with terrestrial SKY service.

Outside of SKY, those who might be considering DTH equipment sales and service as a new area of business activity, and those who might consider cable television as a business investment will find the Fellet interview of considerable interest.

SKY Network growth as of late September is quite phenomenal; 171,223 'equivalent homes' served representing 19.5% of all New Zealand homes within reach of their present network of terrestrial transmitters. In the relatively short period of time that SKY has operated the 'wireless cable' system, this rate of growth ranks their 'penetration' (measure of business success) amongst the highest in the world.

SKY Network utilises standard UHF frequencies to deliver an encoded (scrambled) three channel television service. Similar systems in Europe, North and South America and Asia offer as many as 31 channels of programming by using frequencies in the microwave (2.1 to 2.6 GHz) region. SKY's programme channel rates are the highest (most expensive) of any similar system in the world. SKY's programming has very low 'made in New Zealand' content. Whereas Television New Zealand and TV3 are virtually mandated through New Zealand On Air to provide between 30 and 40% of total air time from New Zealand programming sources, SKY has no such restrictions. SKY's ownership is multinational with a minority interest held by New Zealand individuals and by Television New Zealand. SKY management is multinational as well (Fellet is an American with a substantial background in the U.S. cable television industry) but as the following illustrates, the level of 'Kiwi consciousness' is high.

SKY's NEW CHANNELS

SKYWATCH (c), the monthly on-subscription SKY consumer publication for September, announced the expansion plans for two new channels of service (CTD: 9312). The announced new services have generated excitement, enthusiasm and confusion. SKY expects to charge viewers additional money for the two new channels; the present \$44 per month fee will increase by an as yet unannounced amount for those subscribers taking all 5 services.

Of the two new programme channels, one is to be shared with TAB (horse racing) coverage. TAB owns, and through BCL operates, their own network of (UHF) transmitters. In Christchurch, TAB has used the transmission facilities of CTV for its approximately 21 hours per week of transmission time. TAB coverage is being increased with new transmission facilities to fill in those areas where SKY presently operates but TAB does not.

CTD: What are the programming sources SKY will be drawing from for your new service channels?

FELLET: "From the very beginning we wanted to 'build' one of the two channels ourselves. ('Building' simply means SKY plans to use multiple programming sources for one new channel, 'building' the programming day by scheduling programming from several sources as opposed to simply taking a direct satellite feed of a channel which has been 'built' elsewhere.) We felt we had to have a little 'Kiwi flavour' to the channel."

CTD: How do you define 'Kiwi flavour'?

FELLET: "Programmes which we believe are for this market; none of them, to the best of my knowledge, will be actual

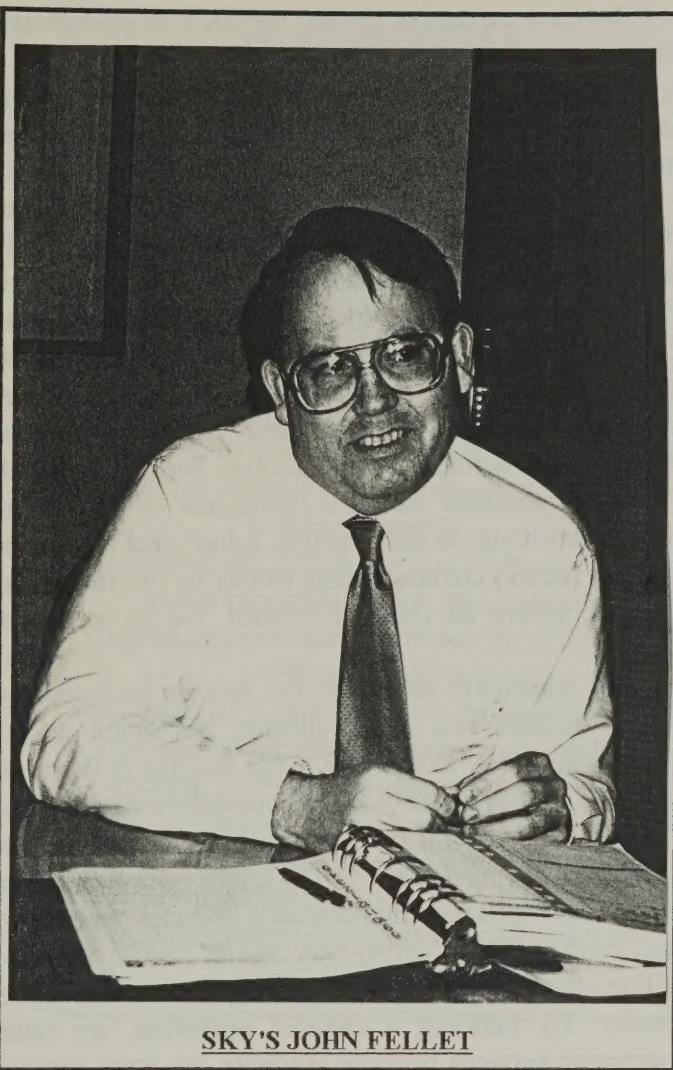
Kiwi productions however. TNT is an example. Turner is mixing 12 hours of cartoons per day with 12 hours of vintage movies. That may not be the best mix for New Zealand. Kiwi's perception of TV programming is quite different than Americans. In the US they watch 60 hours per week of TV and honestly believe they are watching 40 hours. Here, Kiwis watch 20 hours and think they are watching 40. In the TNT service, if I had access only to the movie portion, I think I could live with it. But I believe New Zealanders may see the cartoon portion as frivolous"

CTD: Does that mean you will downsize the cartoon portion?

FELLET: "We are talking to Turner about this problem. I'm not certain we will end up using any of the cartoon segment, actually. We might want to fill that day part with programming that has better educational value than cartoons. Turner is not very pleased with this and they have never allowed affiliates to take segments of their 24 hour day with the TNT service."

CTD: That means you may end up not using TNT at all then?

FELLET: "Our fall back position is that we have secondary sources for the children's portion; programming that would come in here like our movies now do (i.e., one programme at a time, in a tape canister, to be scheduled and run by SKY). This will cost us more to programme, and it will be a bigger manpower chore for us to schedule and run these programmes."



SKY'S JOHN FELLET

"The least expensive system for SKY to operate is to contract with a programmer such as TNT and simply connect the TNT service from a satellite receiver to the SKY terrestrial network. The hour to hour manpower requirement for such an approach is almost non-existent. On the other hand, 'building' a channel programme by programme ties up tape machines, production facilities and requires personpower to achieve."

CTD: Are you showing a sensitivity here to the recent public outcry against children's cartoon series which some parents have characterised as being excessively violent? (Television New Zealand recently cancelled Mighty Morphin Power Rangers citing the show's physical confrontations as being objectionable to many viewers.)

FELLET: "Yes, I guess we are. Unfortunately most cartoons are action oriented. And while that may be standard fare in just about any market in the world, there is a sensitivity to it here. It is not an anti-American or anti-Japanese sentiment, it is a cultural issue. I wish this only applied to cartoons, that would be easy to solve. But if you look at the sports, the movies, even the news, the orientation towards violence permeates all programming categories. And SKY cannot operate without sensitivity to those issues. I don't feel we can be censors for material sent in here live, such as CNN (news) coverage; that would be too much like Singapore. Those programme services we do build, where we do have control, we try to exercise good citizenship. Perhaps we are overly sensitive."

"This sensitivity challenge for movies is especially acute. Movie themes dictate content and content dictates box office success. As much as I might personally be opposed to excessive violence, very few movies are made like 'It's A Wonderful Life'."

CTD: This particular 'you-will-build-it-yourself' channel, will it have a name?

FELLET: "It will but I prefer to withhold that name until sometime after October 1st. For purposes of the next issue of CTD, let's refer to it as the general entertainment channel (GEC)."

(The new 'general entertainment channel' will be known by a single word of six letters, in the same trend as 'SKY News', 'Sky Sports', 'SKY Movies'.)

"The other issue to totally building a service involves the fact that we do have a limited channel capacity. By building a channel ourselves, we retain a degree of flexibility so that as new programme services become available, we have someplace to put at least some of their content. If every channel we provide is precisely defined, such as SKY Sports, we have less ability to slide into our offerings a few hours per day from a new service. Our (general entertainment) channel will give us programming latitude we would not otherwise have and this channel will be aimed at the same market which TV2 and TV3 aim to reach. Those will be our demographics; the 18 to 30 something audience."

(The GEC is the fifth channel in SKY's package; it will be available on approximately 1 December in most North Island locations.)

CTD: Before you have the GEC operational, on October 1st you are scheduled to begin filling the more than 140 hours per week on the TAB channel. How will that be programmed and will this channel have its own identifier name?

FELLET: "We have been dealing with (the) Discovery Channel on that and we thought it was going to be pretty straight forward. Just this week we were notified that Discovery will not be available to us until December 26. SKY's use of Discovery was to be shared with some of the new Australian (cable and MDS) system offerings. We were not given a reason why the start date has been pushed back until December 26th; I am guessing it has something to do with the Australian customers not being ready to start using the programming there."

(Discovery will be brought into New Zealand on PanAmSat PAS-2. For an update on the status of PAS-2, see page 27 in this issue.)

"With programme suppliers there is an initial lease of the transponder which typically involves up-front money followed by monthly payments for the transponder (see CTD 9404: p.2 and 9405: p.2). As much money as this could be, the cost of actually providing the uplinked programming to the satellite can be even more costly. Discovery, like others, will avoid the uplinking and programming creation costs until they have a reasonable number of users 'on line' and ready to go. It is my judgement the Australian's are simply not ready to go yet.

"As for a name, it will be known as the Discovery/SKY service."

CTD: Discovery, like several others, are faced with new marketing programmes throughout Asia at almost the same time as New Zealand and Australia are 'kicking off'. Isn't this also a factor?

FELLET: "If you want English speaking income, today, you are better off launching a new service first for India. We are English speaking, and on an international scale our comparative incomes are high. But there are simply not that many of us, even with Australia included."

CTD: Your immediate problem is what do you do by October 1st, the day you begin programming the TAB channel.

FELLET: "Our first option was to ask Discovery to help us out by sending tapes in lieu of their satellite feed. If they cannot do that, can we source programming similar to Discovery elsewhere on an interim basis? One other source is the BBC. If you are the BBC, you have to think to yourself 'Do I really want to pour money into helping SKY get set up for the Discovery Channel?' The answer is probably 'no'. Another option is that TVNZ has a huge library of nature and science type programming. If we do these things, even short term, we are back to 'building' a channel again, although I suspect given the universe of programming material out there and available, this channel might be the easiest to clone. As we sit here (22 September) not all of those decisions have been made."

CTD: At the present time you depend upon TVNZ and Telecom to provide you with feeds from CNN and ESPN for your news and sports channels. With your satellite universe expanding, with Discovery to come from a satellite other than Intelsat at 180, would it not make some economic sense for SKY to have its own downlink dish here at the studio?

FELLET: "It would and I had our engineers do the calculations for dish size and type. Given the footprint of PanAmSat, a dish in the 8 to 9 metre range would satisfy our particular needs.

THE SKY SHUFFLE

October 1st: SKY plans to activate downtime hours on TAB's regional transmitters. This channel was scheduled to be called 'SKY/Discovery' but programming from Discovery via PanAmSat PAS-2 has been delayed until a planned December 26th start. SKY will fill the period until December 26 with nature and documentary programming from backup sources possibly including TVNZ. TAB will continue with their 'new' 21 hour per week live racing coverage on the same channel.

December 1st: Subject to completion of new transmitter installations, this general entertainment channel (to be called SKY O) will mix music videos, movies, syndicated programming from multiple sources in a 'SKY-built' service aimed at the middle income 18 to 30-something crowd now pursued by TV2 and TV3.

To Be Announced Date: Present HBO/SKY Movies will be reformatted to play pre-school to teenager programming from approximately 6AM to 12 noon.

However, you must remember that Bell Atlantic and Television New Zealand own stock in SKY and are active in its growth decisions as stockholders. Neither firm was anxious for us to have our own downlink and for now the project died."

CTD: Why would they be opposed to SKY having a downlink?

FELLET: "Telecom (Bell Atlantic) is the national signatory to Intelsat and that gives them special rights in New Zealand as a satellite system's operator. It is an assumption on my part, they never said 'why', but I suspect that both TVNZ and Telecom would simply rather keep the number of firms capable of competing for downlink business as small as possible."

(Elsewhere in the world many of today's uplink firms began by installing their own quality downlink antennas to handle incoming feeds for clients, later have expanded to uplinking capability. This development of competition in the downlink-uplink marketplace has caused prices for these services to tumble downward; a situation the original satellite terminal owners have seldom appreciated.)

CTD: Will you have access through Television New Zealand to any of the BBC product which they will be taking on their planned digital feed (CTD: 9401, p22) but which they have no immediate plans to use?

FELLET: "(In our discussions) they have left the door open on this one. I suspect they will probably need it for their Horizons product (CTD 9407; p.48), kind of as how we use ESPN primarily as a backdrop service, to establish a product identity for the sporting channel. You really need to get direct confirmation from Television New Zealand."

CTD: In June you found yourself with two live, simultaneous sporting feeds and you scheduled one onto the News channel so as to be able to carry both live. Will five channels change this scenario?

FELLET: "If this happens again, I suspect the primary audience programme such as a Rugby match will stay on the Sports channel while the secondary sporting programme, such as the NBA (basketball) finals will flip to the GEC service. We now have enough People-Meters in place that we are beginning to get viewer preference profiles back which are very helpful. When a Rugby match is on, for example, the audience is weighted towards older viewers in direct opposition to the audience for an NBA or (American) gridiron match where the audience age favours younger viewers. CNN news is much the same; older viewers predominate. So when we planned to lift CNN off the News channel to slide in the NBA finals game while Rugby was on Sports we left the older viewers not interested in sports with no place to go. Then O.J. Simpson picked that weekend to run from the police all over Los Angeles and we ended up staying with CNN coverage of that drama and taping the NBA for later delayed playback. I never want to get into that situation again!"

CTD: Subscribers will now be faced with a selection of five separate service channels and logic suggests that you will not provide a total of five channels for the same price you have been charging for three channels. How will this be structured?

FELLET: "I have a problem with describing this in detail since your publication date is in advance of our public announcements. I would rather we control the release of this pricing information. Having said that, subscribers will of course be allowed to continue with the present three channels for the same monthly fee they are now paying. Beyond that, the subscribers will be given various packaging options such that each home can elect three of the five service channels they wish or, alternately, which four, or, all five.

"Our subscriber penetration is an interesting study in New Zealand demographics. If you draw a Bell Curve of the population plotted against income level and then overlay that with our subscriber

penetration, you will find we are strongest at the two extremes. The upper income brackets have a high penetration because it is a lifestyle decision; they take SKY for the same reasons they belong to certain clubs, dine at certain restaurants. The lower income bracket is equally high and here while the money spent on SKY is a sizeable portion of their disposable income each month, this income bracket is extremely loyal to the SKY service. On a scale of entertainment return against dollars spent, the perception with the lower income bracket is that SKY offers them excellent value. It is in the middle of this income curve that we expect our new programming to be most effective; the exact region where we now have our lowest penetration of homes."

(Similarly, in North America the most difficult 'sell' for cable TV has always been the middle income range. Cable operators there have learned that niche programming channels catering to specialised, offer better educated viewer interests have greatly increased the penetration of cable to such homes. The U.S. based 'Discovery Channel' has been an important attraction for such homes and apparently this fact has not gone unnoticed by Fellet.)

"The five channel total also gives us an opportunity to address another marketing problem; the older viewers, let's call them pensioners, who out of our present three channel service find the movies to be the least attractive programming. They would probably like to have a lower service cost. Now the movies happens to be our most expensive channel to programme out of the three. There may be some way to accommodate this market group by eliminating the movies from the mix."

USING THE TAB FACILITIES

CTD: When SKY was the winning bidder for the down time on the TAB network, you hailed this as a positive step forward for SKY. Do you still believe this?

FELLET: "I do. Our agreement with TAB precludes them from selling off any of their down time to a third party. We are guaranteed a minimum number of hours per week in the contract. Their transmitters were in place, or scheduled for construction, and were being under utilised. This is a good marriage for us, for TAB."

CTD: Why do you suppose TAB selected SKY as the winning bidder for their down time over other competitors who also bid on that down time?

FELLET: "I was not a party to their in-house deliberations but I have a theory. It goes like this: From what I believe about their audience, it is a small niche group of hard core fans and in the present day growth cycle of New Zealand where most markets are growing in size, their market is getting smaller. As merely one example, Lotto is another form of wagering and it has been a competitor for market dollars. They need to attract new fans for horse racing which is one of the primary reasons they created a television network in the first place.

"SKY's audience tends to be a younger, more affluent segment of the market and if I were TAB, I would like to attract new fans to horse racing from exactly the market SKY now reaches. They have been operating for nearly two years, and they don't show up on any People-Meters (audience measurements). By allowing SKY to share their transmitters, we bring to the channel an audience. They probably hope this audience will grow so accustomed to flipping through our five channels to see what's on, that some of these channel surfers will stay with the TAB coverage when they are using the channel. As long as they were operating out of the mainstream of telecasting, that was a casual tune-in they would never attract."

CTD: At the end of the bidding cycle, who were the serious contenders for the TAB down time?

FELLET: "Television New Zealand was in there, for their then-planned Horizons Pacific service. Channel 7 out of Australia was a serious contender, possibly planning to use it for an independent near-national service."

THE TECHNICAL SIDE OF EXPANSION

CTD: Where are your new transmitters sourced, and what part does BCL play in taking your new transmitters and putting you on the air at each of the locations?

FELLET: "The smaller (typically 100 watt) transmitters we purchase from a speciality company in France. The larger units are typically currently coming from Thomson. The units arrive in a crate and go to BCL. With our engineering department, the transmitters are taken to each transmission site and installed by BCL. We negotiate each new site with a contract. Normally BCL provides the transmitters as well. However, with the possible exception of TV3 we currently buy the largest volume of new (UHF) transmitters in New Zealand. We have been able to get a better price for transmitters than we could negotiate through BCL. So we purchase our own units."

(Not all BCL site users have been able to make that decision; see CTD 9403; p. 2.)

EXPANSION INTO UNSERVED AREAS

CTD: With all of this expansion adding the 4th and 5th channels, what has happened to your own internal planning and time table for first-time expansion into still unserved portions of New Zealand?

FELLET: "Expansion into new markets has not been impacted by the channel expansion. But, our own time schedule for further market expansion has been slowed down."

CTD: Explain.

FELLET: "Here's the situation: Am I sure I want to use current (terrestrial microwave relay) delivery mechanisms to take signal into presently unserved New Zealand markets (i.e., New Plymouth, Whangarei, et al)? The answer is I am not sure the best use of SKY's expansion budget is to continue extending our reach through terrestrial microwave connections."

CTD: Let's take Whangarei as an example. There are a handful of subscribers there now using SKY. They have typically spent \$500, even \$1,000 with an aerialist, to install sizeable off air antenna systems with low noise masthead amplifiers to produce sometimes quality, sometimes snowy SKY signals. Using the same technology, refined, it would be possible for an experienced person to produce high quality SKY signals in the Whangarei region and then distribute these SKY service signals on a cable TV system. However, your policy at present is that you will not authorise a cable TV system in New Zealand to carry your channels. Is that corporate policy likely to change during 1995?

FELLET: "I don't know."

CTD: Let's come at this from a different direction. You have been approached by entrepreneurs who would like to extend the present reach of SKY into areas you do not presently reach. What is your policy on such proposals?

FELLET: "We have not ruled out that we would deal with private entrepreneurs."

CTD: Let me cite an example of where this has already happened. In Te Kuiti, a TV service shoppe owner was encouraged by a local professional person to figure out some method of extending the SKY service to his home there. The service shoppe owner found the SKY signal on a nearby hill, built a 1 watt on-channel linear booster station which extended the reach of the SKY channels to the Te Kuiti area. Presently this 'reflector', as it has become known, provides SKY service to more than 200 Te Kuiti homes. Do you encourage this type of private expansion of your signals?

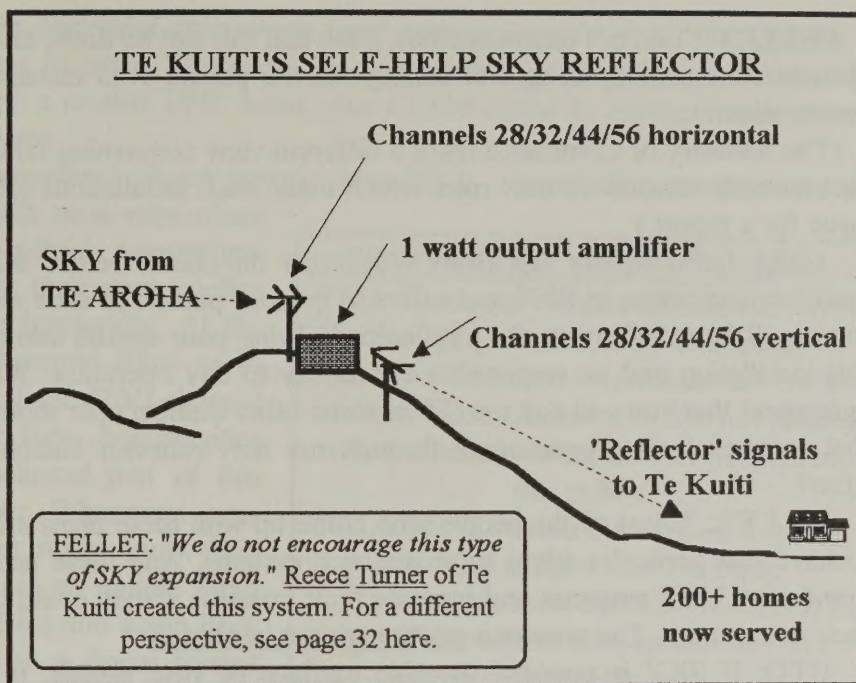
FELLET: "We do not. Let me explain why. Originally when some enterprising aerialists found there were small areas within Whangarei where the SKY signal was available on knife-edge refraction, we told people who wanted service within those knife-edge areas we didn't presently serve Whangarei and they could not have service. So they drove down here, signed up for a SKY decoder over the counter, took it back to Whangarei and had their aerialist put in a sizeable antenna. We don't like this

happening. The installation price is never cheap because the aerial arrays are complicated and expensive. This is a lot of value-added by the local installer and we think that attaches an unfavourable cost of obtaining SKY to the mindset of people in Whangarei. Down the road, when we actually extend service to Whangarei and come in with our opening \$75 install price, these people may feel they have been cheated. They won't blame their aerialist; they will blame SKY. That's not good for our image. But we can't win on this one, and we have given up fighting it. But we do not encourage this, we do wish it was not happening.

"Now take this a step further; from a \$600 aerial in Whangarei to Te Kuiti where someone on their own sticks in a reflector (station) that suddenly brings SKY into a new area. We are not in control, we have nothing to initially say about the quality of the reflector unit, and yet if it misbehaves or produces poor pictures, we get the blame. Basically, the installation of a reflector (station) forces or dictates to us our next expansion area. And we lose control of our own business plan. That's not what we want to do.

"If I had my choice, I'd put up transmitters where I want to put them up, cover areas far larger than the reflectors do, make it a part of our overall marketing plan, and retain control of our growth. A reflector put in by a local takes all of that away from me. Additionally, there are the legal questions. The reflectors serve to increase the coverage areas beyond their defined limits. This brings in the spectrum managers from Wellington who see us as participating in a programme to enlarge our service areas without going through them and the proper channels. In the case of Te Kuiti, the first installation also created some technical problems for the cellular telephone users in the area and SKY was blamed for these problems even though at the time we had no direct knowledge of the installation and certainly no involvement. To straighten Te Kuiti out, we finally agreed to purchase the reflector station from the local entrepreneur, assume the \$1,000 per year lease he had signed for the hilltop site, and use our engineering time to help straighten out the interference problems caused by the reflector with cellular telephone. We are pleased with the additional 200 subscribers in Te Kuiti; we are not pleased how we got them."

CTD: And if someone else does the same thing as was done in Te Kuiti?



FELLET: "I do not encourage this; I ask that this not be done, and in the future I will be far less interested in coming along and bailing out the person who installs such a gadget to clean up a messy situation."

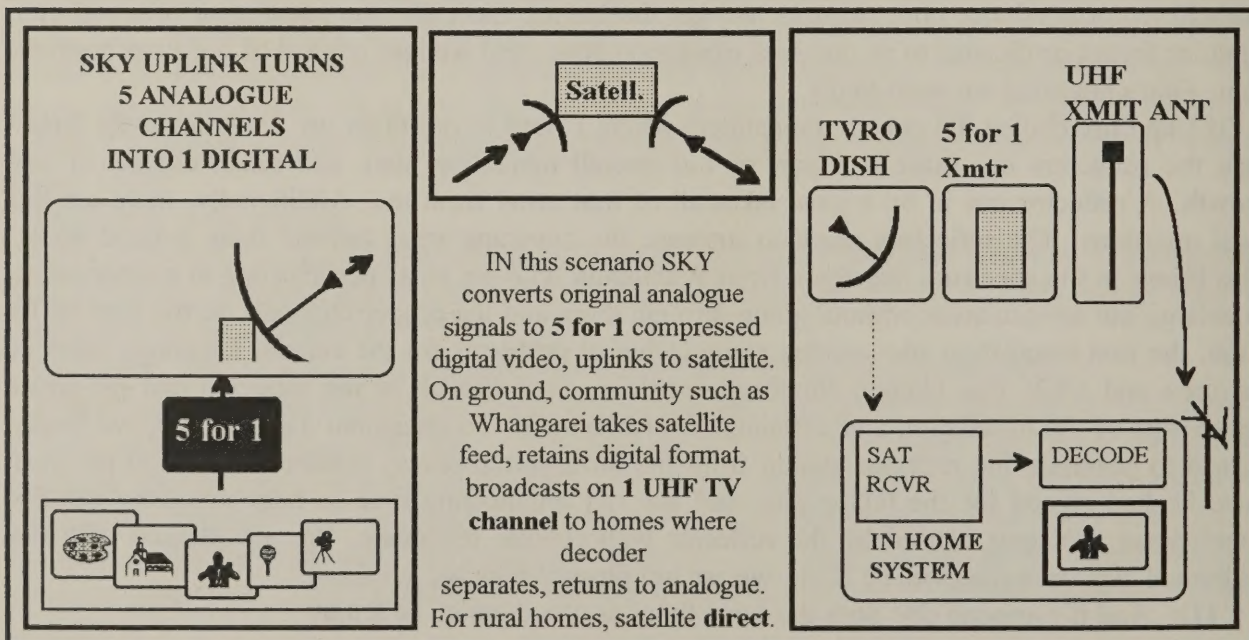
(The Ministry of Commerce takes a different view concerning UHF 'reflector' stations and has in fact recently announced new rules which make such installations totally legal. See page 33 of this issue for a report.)

CTD: Let's explore this from a different direction. Before such a reflector is installed, an entrepreneur comes to SKY and offers to be your partner in such an installation. Perhaps they say to you, "I know where to site a reflector to bring your signals into (name of town); I will pay for this installation and be responsible for its day to day operation. What I want from SKY is your agreement that you will pay me (\$5 or some other number) per month for each subscriber to SKY that receives their programming through my new reflector station." Your response to such an offer?

FELLET: "Most of the people who come up with these plans are aerial contractors; they seem to have that particular talent to create such systems. And these people figure out they could sell brand new UHF antennas and increase their business if they could get the SKY UHF signals into their community. The answer is no, we are not interested."

CTD: If SKY is opposed to cable carriage of your signals, if SKY is opposed to reflector stations to increase your signals into unserved areas, what is the message you are sending to rural areas of New Zealand; do you simply believe because of terrain, distance and widely scattered population they can be written off and not served?

FELLET: "There are other alternatives, none of which are viable today. There is a thing called satellite technology which CTD readers are familiar with (broad ear to ear smile follows). For example, we could compress five SKY terrestrial programme channels into a single digital service transponder, pop it up on the bird, and deliver it directly to a rural home. Compression would also allow us to feed an area such as Whangarei by installing a single digital reflector for the community taking down the satellite fed group of five channels and then run them through a single channel terrestrial transmitter and back out to the homes in the area. This would eliminate our having to



interconnect Whangarei with terrestrial microwave, and reduce from 5 to 1 the number of transmitters we would require to serve Whangarei. In this scenario, each Whangarei subscriber home would be equipped with a modest UHF aerial, plus a UHF digital to analogue transverter in place of our present decoder box.

"Thus a five to one compressed digital service from SKY, via satellite, would serve two purposes: First, it would reach rural subscribers beyond reach of our terrestrial transmitters directly and they would have their own satellite dish and digital to analogue transcoder. At the same time, the satellite feed would allow us to interconnect our network to single (TV) channel digital format relay stations from communities such as Whangarei. The technical part of this would be transparent to our Whangarei area subscribers; they would never really know their SKY service left Auckland on an uplink, went through a C or Ku band satellite and came back to a satellite dish connected to a digital format 'reflector' that in turn rebroadcast the five channels in digital form to their inexpensive UHF rooftop antenna and into their set-top digital to analogue transcoder. Their pictures would be no different than the pictures our viewers in Auckland or Wellington receive from terrestrial analogue transmitters."

CTD: Let me make it clear this is a postulation; this is something you are studying at this time, not a business plan you have already approved.

FELLET: "That's correct. You asked me whether we are going to write off the rural viewers in New Zealand, and I am saying that we do have options to serve them. This system I have

described is one such option. Digital compression is an important new tool to all of this; when we can eliminate four of the five transmitters that would be required to expand into Whangarei, for example, by compressing all five of our programme channels onto a single satellite transponder, and then relay them to homes in Whangarei through a single UHF transmitter rather than five UHF transmitters, suddenly smaller, more rural areas become viable for SKY expansion."

CTD: Are there other options available to SKY to serve rural viewers?

FELLET: "I keep seeing these television commercials where Telecom has Spot jumping through fibre optic hoops from big cities to rural communities and that leads me to believe they may be in those rural areas fibering the whole world."

CTD: If I thought you really believed that I would terminate this interview at this point.

FELLET: "Don't leave."

CTD: OK. Let's then return to cable TV. I keep hearing from people who want to build traditional cable TV systems to serve communities that presently do without TV3, or SKY, or both. Or communities with a concentration of Asian ethnic groups such as Chinese people. These

SKY'S INSTALLER RELATIONS

CTD: Your policy is that installers are to be paid \$8 per home to go to existing subscriber homes to adjust decoders for the two new channels. Installers are not pleased with this arrangement; how do you defend this policy?

FELLET: "I believe the fee paid varies by area. This is done on a bid basis."

CTD: I believe these installers are afraid to say 'no' out of fear they would lose their existing relationship with you.

FELLET: "If they are unhappy, have them call me personally. I am not aware there is a problem here and I'd like to investigate this or any other complaints."

CTD: If they come to you, rather than to the person they normally interface with here at SKY, will there be recriminations; will they have trouble later with their normal SKY contact?

FELLET: "Their contacts with me will be between the two of us, only."
(John Fellet: 09-579-9999)

would-be entrepreneurs know that cable TV is one technical answer to providing people with services they are presently denied. Yet there remain questions concerning the legal rights of a cable operator to automatically carry some classes of programming via cable into homes. SKY is presently in a legal action before the Copyright Tribunal involving Kiwi Cable in Paraparaumu. Kiwi Cable seeks a ruling that would force you to either allow them to carry the SKY services, in particular the sports channel, or, a ruling that says SKY cannot legally keep Kiwi Cable from contracting directly with ESPN for their satellite fed service. What is the status of this case today, in your mind?

FELLET: "Our attorneys are confident we will win that, but I don't know what you expect me to say other than that. I am certainly not going to say 'We expect to get our hind end handed to us on a platter'."

CTD: If you do win this case, and Kiwi Cable is denied access to ESPN either through SKY or directly off of satellite, how might that change the way you do business in New Zealand?

FELLET: "I am not an expert on this, but it appears the new copyright legislation being discussed may supersede anything that happens in the (Copyright Tribunal) court."

CTD: Where does this leave Kiwi Cable? If they lose at the Tribunal, or, if the new legislation gives you the right to continue refusing his request for service, how damaging is that to Kiwi Cable?

FELLET: "I would rather not speculate on that."

CTD: SKY's contract with Cable News Network spells out your rights to deliver CNNI through over the air transmission. This contract does not grant you exclusive rights to CNN for other forms of signal delivery, including cable TV in New Zealand. Right or wrong?

FELLET: "Right."

CTD: Same question, substitute ESPN for CNN.

FELLET: "Wrong; our exclusive agreement with ESPN is without respect to the delivery mechanism. Both over the air broadcast and cable, for example, are covered. But they do have options. For example, they can say to us 'We have been offered \$50,000 for the NBA Finals this year by TV3' and then we have the contract right to either match that offer, or, pass on that programming. In this hypothetical example, TV3 would end up with the NBA Finals because they would have offered more for the programming than we were willing or able to pay. Thus our exclusive agreement only pertains to events where we are the highest priced bidder. Anyone else can in theory outbid us for any event if they wish."

CTD: So you buy ESPN in bulk, and take almost everything they offer. This gives you a bulk quantity price but you are always subject to someone else coming along and outbidding you for ESPN programming?

FELLET: "That is correct."

CTD: With respect to satellite delivery of ESPN, is there contract language that protects SKY from ESPN programming being delivered here directly to the home or motel?

FELLET: "We could prevent this happening."

CTD: So if ESPN shows up on the Palapa C1 satellite next summer and New Zealand happens to fall into the new C1 footprint, you could stop individual homes in New Zealand from subscribing to ESPN via the Palapa service?

FELLET: "We could. But that is not to say we would. There is a price for everything; we might elect to become an agent for ESPN service via Palapa here in New Zealand and rather than simply denying that service here, we would become a part of the revenue stream for it being available here via Palapa. Actually, we already do that in hotels (with the ESPN feed on Intelsat at 180) in areas

where SKY does not reach; they come to us after arranging for their own satellite dish installations and we sell them an NTSC format B-MAC decoder. We then go through the procedure of having the decoder authorised, and they pay us a monthly ESPN service fee which is very similar month to month to a regular SKY service fee. In fact we now do this for anyone outside our service area whether they are a private home or a commercial installation. The procedure is already in place."

CTD: Now let's ask about your arrangement with Discovery Channel. Imagine a satellite dish owner in Auckland who has access to your SKY service, but who wishes to subscribe to Discovery delivered via satellite because they want 24 hours per day of Discovery, not the six or twelve hours per day which SKY is providing. How does SKY fit into this situation?

FELLET: "In this example we will not have an exclusivity agreement with Discovery. If Discovery wants to serve individual home owners in Auckland or Kaitia or wherever, that's not our concern. That's between Discovery and the dish owner, or the hotel with a dish, the cable operator that wants Discovery."

CTD: Then the same question as it applies to TNT/Cartoon Network?

FELLET: "In these cases we are not taking 24 hours per day of their services, we are not their exclusive distributor here. In each case cited someone with a dish will be able to go directly to the programmer and subscribe to the service."

CTD: Is this because you are not taking their full 24 hour day?

FELLET: "Not totally. The satellite programmers are moving away from exclusivity arrangements; it is harder and harder to get exclusive rights to any service anymore. Certainly the first requirement if the programmer will consider an exclusive arrangement is that you take their full 24 hour day. But even then you may not get exclusive rights to a programme service for an entire country."

CTD: Cable News Network is an example of this?

FELLET: "Correct. It's an economic call. The programmer has to be willing to forgo any other source of revenue in New Zealand to grant SKY an exclusive arrangement. Thus SKY must be willing to pay the programmer the equivalent of what they could receive from all revenue sources if we are going to have exclusivity. In theory I might be able to buy exclusive rights for over the air, direct to home, cable and SMATV for a service; in practice, I would be paying so much for all of these 'rights' that the cost to me for the service would exceed what I could sell it for using just my over the air system. So I can't afford to buy the exclusive rights."

"We think exclusivity is important, but it is not the entire competitive game. We think it is more important to have product identity, a mix of programming which creates an impression of 'The Sky Service' in the mind of the consumer. In a competitive environment, and it is coming even if it is not here now, you have to differentiate your service by making it unique through its own identity and image."

CTD: A hypothetical question. I want to build a cable TV system in Kaikohe: 1,205 homes, 30 kilometres of cable. And I want to use ESPN and CNNI and perhaps other services for which SKY has a contract, on this cable system. With the presumption that SKY does not plan to directly serve Kaikohe with its own transmitters within say five years, how do we sit down and work out a commercial agreement whereby I can use these services, in particular ESPN? You have already told me that even if I am clever and can find a way to bring SKY's programmes into Kaikohe direct, you won't allow me to carry them.

FELLET: "First I would rather defer an answer on this question until we see how the Copyright Tribunal case with Kiwi Cable works out."

CTD: Why?

FELLET: "Because I don't want to set up ground rules one way and then have the Tribunal case come along and change the rules we have agreed upon. Second, you have loaded this hypothetical question with the assumption that within five years I am not going to Kaikohe. I don't happen to believe that is a valid assumption so the hypothetical question is moot."

CTD: Then pick any town in New Zealand you wish with at least 250 homes and substitute it for Kaikohe in my example.

FELLET: "With satellite I can go to any place in the world. Whether there are 25 homes or 250 homes. Or if Telecom builds that fibre link I could reach anyone I wished."

CTD: Yeah, right.

FELLET: "Have you been out there? They have 600 homes passed ... already."

CTD: Well, that only leaves 1,145,237 more homes before they reach mine. Now, if SKY did go direct to satellite and then direct to home, does that mean SKY would still refuse to negotiate cable rights with a cable operator in Kaikohe? If you have direct to home service for all of New Zealand, does that preclude you from ever signing a cable carriage deal with a cable operator here?

FELLET: "Can we go off the record here?"

The off the record discussion investigated why SKY might wish to be 'selective' in choosing its cable affiliates, if in fact it did allow cable firms to carry their signals. Cable, in Fellet's mind, is not dissimilar to the self-help reflector in Te Kuiti where someone other than SKY decides for SKY they will expand into a new market area. It is a control thing; through a cable operator SKY fears losing 'control' of its image, its packaging, and the relative strength of its programming package. Fellet is concerned that a cable operator not carry SKY as a means of building a high cable penetration (audience), and then fill the dial with other programming which might ultimately be available to the cable subscriber in competition to the SKY services.

Back on the record.

"We will study each situation on a case by case basis, but still must await the outcome of the Tribunal hearing in any event."

CTD: On a case by case basis, there are New Zealand communities which have the following characteristics:

- 1) They are situated on the southside of a hill or mountain such that anyone living in the community will be blocked from the satellite signals and therefore cannot use direct to home satellite service;

- 2) They are so located that like those people who still after 34 years do not have TV1 service will not be in a position to have SKY terrestrial service either.

You will always be faced with some of these situations. Is this an example of where someone could come to you with a plan for a cable service and on a case by case basis find you receptive to their private entrepreneurship extending your service by cable?

FELLET: "That is exactly such an example."

CTD: If someone reading this lived in a community that meets all of those criteria (southside of hill or mountain, beyond economical terrestrial reach, too small to be viable for a satellite fed 'digital reflector'), would such a person be smart to start now thinking about the possibility of putting cable in, planning a business around this eventuality? Would you give them any encouragement whatsoever that down the road a ways they might be able to negotiate a package with SKY and carry the services?

FELLET: "Yes. If you phrase it exactly that way. If there is no way for us to do it economically, and we can increase our base (subscriber count) and we will be able to say 'We have

30 more homes here because of this cable system' it will help us when we negotiate for Rugby and other programming. Subscribers are important to us."

CTD: We'll carry that one step further. When SKY and this cable operator meet to negotiate an agreement, let us assume SKY is at that time charging \$44 for its service package via terrestrial or direct to home (satellite). How does this cable operator fit into that \$44 per home per month?

FELLET: "We'll presume this mythical cable operator will provide other functions; he will be our sales person, our installer, our agent for the publication SkyWatch, our collection agent and so on. And there are a couple of ways he could do it; he could even use our in home (direct to home) decoder box and at that point he becomes a transmission company, interfacing between our subscriber's home and the satellite antenna system maintained by the cable operator."

CTD: So you do envision this cable operator participating in the revenue stream, unlike the fellow in Te Kuiti who installed the reflector system?

FELLET: "Yes, at a rate to be determined because at this point in time who knows how many channels we are going to have available, how those channels will be packaged for consumer use and selection and so on. The scenarios are quite unpredictable at this time. But suppose, for example, we are carrying the CNN service on one of our SKY (terrestrial) services. Why should we initially take CNN off of satellite, run it through our facility, send it back to satellite and then offer it inside of our SKY package to this cable operator when he could contract directly for the full CNN service himself? Perhaps it will make more sense to offer those channels which have significant SKY content, only, via such a satellite feed."

SO - IS SKY GOING TO SATELLITE?

CTD: Would you tell me without equivocation that SKY has not, and is not, studying the use of direct to home satellite delivery for New Zealand?

FELLET: "I cannot tell you that."

CTD: Would you tell me without equivocation that when TVNZ speaks to you, either directly or through your Board, they are not against the development of direct to home satellite television for New Zealand?

FELLET: "I have never heard them say they are opposed to direct to home."

CTD: Do you personally believe there will be some form of organised direct to home satellite service available within New Zealand within the next year?

FELLET: "Do you mean a package of bundled channels, for sale here, from satellite?"

CTD: Someone offering service to any home in New Zealand equipped with a satellite dish, and there being a mechanism in place for people to order that service and pay for it here.

FELLET: "Yes, I believe that is likely to happen."

CTD: Would you rule out Television New Zealand placing a direct to home service on satellite within the next one year, two years or three years?

FELLET: "I don't know. Television New Zealand already covers the market. Typically broadcasters are not the best people to put in broadband services with multiple channels on them because it goes against their core business. It is like cable operators who have not, to date, been very successful in putting on broadcasting networks."

CTD: Does it concern you, as SKY, that as New Zealand distributor for ESPN, perhaps for portions of TNT, Discovery and others, that you cannot cover all of the many niche programming categories with only five analogue transmission channels available?

FELLET: "There are so many programmers here or almost here that I cannot even begin to tie up all of the services available."

CTD: If you can't take Country Music TV, MTV, Showtime and others for your own use here, do you envision a situation where TVNZ will try to do this just to keep such services out of New Zealand on a full time basis?

FELLET: "No."

CTD: When there is a direct to home service available in the South Pacific, in addition to a possible SKY DTH service, what sort of 'package of programmers' do you feel such a service might include?

FELLET: "Just open up the current issue of Orbit magazine, close your eyes and using a box of pins start marking."

(ORBIT Magazine is a monthly guide to home satellite delivered programmers currently available in the USA. A typical issue has more than 250 A4 sized pages, virtually all programme listings, covering at last count nearly 400 separate programme channels.)

CTD: Orbit represents a huge universe of programming because the North American satellites reach more than 300 million people. This is a small universe; 20 million people if we include Australia. Of those 400 programme channels available in North America, which categories might be first offered here?

FELLET: "To start with I can't imagine anyone doing a direct to home service just for New Zealand. Amongst the first programme channels I would anticipate are a financial news channel (Note: CNBC, a financial news service, is an announced user for PanAmSat 2), a news channel of course (CNN is a PAS-2 announced user), and probably here sooner than in other portions of the world ethnicity channels catering to specific groups such as the Chinese, the Indians, those of the Muslim faith and so on.

"Just last week I had a group of Chinese broadcasters in here with broadcasting connections in Taiwan. They wanted language and origin specific programming to be available on SKY. Their first suggestion was that we drop the English language movies three nights a week and substitute Chinese movie!"

CTD: I assume that tells you something about the expectations of the local Chinese community.

FELLET: "It does. I told them that perhaps the best thing to do might be an MDS (multipoint microwave service in the 2 GHz region) channel if they wanted to get something up and running right away (see this issue, page 32 for a report on recent MDS developments in Auckland). I also gave them PanAmSat's number in Sydney."

CTD: Perhaps you should have given them RIMSAT's number. John, do you see a scenario where SKY's terrestrial services might be available outside of New Zealand via satellite at any time within the next 24 months?

FELLET: "It is nothing that we are looking at. We do have people come here from time to time from places such as The Cooks, Vanuatu, the Solomons. And they say to us 'If I could get transponder time, could I buy a couple of hours per night of SKY programming for delivery to my island?'.

CTD: And how do you react to these queries?

FELLET: "That we are open to discussion, but in most cases our programme use rights don't extend outside of New Zealand proper. We could not, for example, extend our programmes to Australia because we don't buy rights to transmit into Australia. I am told by some of my people that New Zealand rights might accidentally extend to The Cooks and Niue but I believe they stop at that point. So there is a legal, rights, issue here."

CTD: Is this true with all of the programming you broadcast?

FELLET: "Not everything; our New Zealand Rugby rights, for example, may allow us to broadcast the programmes beyond New Zealand. But certainly our CNN rights, our ESPN rights and others we purchase for rebroadcast here stop at our borders. So if we were interested in developing offshore, outside of New Zealand distribution for our programmes, we would have to be prepared to pay for the rights to these new locations and renegotiate with our programme suppliers. As a practical matter, this could be nothing more than new paperwork; I doubt very much Paramount Pictures would object to our extending our rights to The Solomons but we'd have to work that out in advance of doing so."

CTD: But, if the Australian laws changed and suddenly next week the New Zealand SKY Network could be legally delivered to Australian homes via satellite, whether direct or through cable or MDS, you would have to restart from ground zero as far as programming rights are concerned?

FELLET: "That's absolutely true. They receive American movie releases slightly ahead of New Zealand, our sports channel service is already heavily duplicated by their broadcast stations. It amazes me how much American sports programming is carried by Australian television."

CTD: Television New Zealand has a small, minority, position with the new Fiji television service and their plans include a pay television service in addition to the commercial service. Has SKY been involved in their planning for the pay service?

FELLET: "We've chatted about it. What we have to offer is perhaps more on the pure technical side, such as our computer billing system and experience. As far as programming is concerned, they view themselves as programmers and one of the last things they would do is come to me and ask advice on programming."

CTD: I've studied your rates for both home private use and commercial use, and compared these rates to those charged in other portions of the world. I have to say to you that your motel rates are high by world standards. I am concerned that if a direct to home package of programmes comes here via satellite, the first place you may feel the competition is in the motel and hotel market. Are you prepared to deal with motels being offered more channels at lower prices through satellite delivery?

FELLET: "Well actually our home rates are higher than most other regions."

CTD: Yes, but you have higher costs. I'll defend you on that one.

FELLET: "But you won't defend me on my motel rates?"

CTD: It's not defending you that brings this question to mind. It is your susceptibility to competition. Picture this: I'm a motel operator and this nicely attired fellow in a business suit walks into my office. Outside I see a trailer attached to his car and a 12 foot satellite dish nicely folded up on the trailer. He asks me how many rooms I have and I answer 21. Then he glances briefly in a small book he is holding and announces that the \$564 a month I am now paying is too much; he can give me more channels including CNN and a sports channel and a movie channel for less money with his bundled satellite service.

FELLET: "So what was the question again?"

CTD: If there is a competitive threat to SKY's commercial business from bundled satellite services, what do you do to react?

FELLET: "I suspect the loss of commercial business would be the least of my problems if there was a competitive satellite delivered package of channels available here. At the moment commercial business amounts to approximately 5% of my total business."

CTD: So if you lost it all tomorrow, that would not be the end of SKY?

FELLET: "That's right. But anyone who put together a viable threat to my commercial business could probably also make a viable threat to my home business. That would concern me."

CTD: But not in the scenario I just painted.

FELLET: "You are assuming these motel operators would rush out and buy such a system?"

CTD: Not at all. I am only concerned about your susceptibility to this type of competition. The motel operator has a financial incentive to consider an equivalent service for less money. If he can spend say \$5,000 for a satellite dish, three receivers and decoders and cut his monthly bill in half, I think he's a candidate for the satellite package.

FELLET: "I don't know if that is the case. As long as we can differentiate our programming and maintain a high Kiwi content, I'm not so certain that a programming package to motels is a threat. There was a time here when American programming appealed because it was American programming. Now with three commercial channels and three SKY channels all containing significant American content, throwing up a sign in front of a motel that announces 'American TV Here' is not such a draw. It might actually be a turn off to some people. On the other hand, if a dealer can toss a satellite dish in a backyard in a few hours time and deliver a plethora of sports programming into a consumer's home, that is more concerning.

"What we have done with SKY is to create a 'brand'. You see 'We Have SKY Here' signs in front of thousands of places of business in New Zealand. Drive in the USA and you see occasional signs announcing HBO or CNN but nothing compared to the frequency and impact of the multitude of SKY signs. We have worked very hard to create this brand identity and I think any competition will find that a tough hurdle to overcome.

"A motel that takes down its 'SKY Here' sign in favour of a 'Satellite TV Here' sign may find itself at a significant disadvantage."

THE CONVERSION TO DIGITAL

CTD: Digital TV is now here via satellite, very shortly on a regular simulcast service basis in the UK and USA with terrestrial service. When will SKY convert from analogue to digital?

FELLET: "When it makes economic sense."

CTD: When we first discussed digital for SKY one year ago, you were reserving your corporately owned 4th channel for digital expansion; now you have gone ahead with the (GEC) service on that channel. In some cities you own a fifth, presently unused, UHF channel. In others you do not. How will you now implement digital in those cities where you have no remaining growth channel capacity?

FELLET: "There are such cities and it will be a problem. I suspect the way we will do it is to pick one of our own analogue channels and announce a new pricing structure. On that one channel we'll terminate the analogue feed and replace that with a compressed digital service. People who want that channel will have a new set-top box installed to do the digital to analogue service. And the good news will be that those people electing to upgrade to digital for that one channel will also then have access to perhaps four additional programme services that will accompany the prior available service on that channel."

CTD: In this scenario, you do conversion to digital at the same time you add up to four new programme services?

FELLET: "That's right. And that is one possibility. Another one is for us to go to some firm holding a nation-wide license which they are not using; such as BCL or the Christian group, and say to them 'Look, unless you plan a launch within the next six months, I need an interim, temporary channel to use for my conversion to digital'."

CTD: What things must happen with digital before you are ready for such an upgrade?

FELLET: "The public could care less about this new technology; they, in fact, never will care. For SKY, digital is going to initially be more expensive. So I have to be able to say 'Can I bundle these programmes using digital and increase our revenue sufficient to offset this expenditure?' "

CTD: Would you also agree that today the hardware you require, especially for the home end of the system, is not available in a form you require nor at a price you can afford?

FELLET: "I'd agree."

CTD: If the hardware became available tomorrow at a price you could afford, but the programming you would select for this new digital bundle was not available, would you make the change anyway?

FELLET: "No, this conversion will be pushed first by the availability of new programming we believe will sell in New Zealand, and when that happens if the hardware also meets our needs, we'll go with digital."

SKY GROWTH TOP-OUT

CTD: As you approach the 200,000 subscriber mark and averaging 1 home out of 5 as subscribers, what thought has been given to topping out or plateaux in your growth?

FELLET: "If I had begun with 40 channels I am not 100 percent certain my penetration would today be significantly higher than it is now. I draw for example on the cable TV experience in Britain. Cable growth there was initially stunted by the overwhelming channel selection; the exact opposite of what happens in America. The British viewers had grown comfortable with their limited channel selection and were apparently put off by a ten fold increase. The British cable operators found solutions to this problem but it required some very extensive marketing programmes.

"I am not so sure we cannot duplicate the same penetration rates of the United States (currently near 62%) here. It will take time, it will require an expansion of channels, and it will require some significant increases in our marketing programmes.

"Growth comes down to a price - value relationship. If the perception of value is there, whether we have 1 channel or 100 channels, the business will grow and ultimately be profitable.

"What is most unique about SKY is that it is truly a Kiwi innovation. The founders of this company very carefully studied the pay TV delivery systems available in 1990. They realised that first you needed the delivery technology and once you had that solved you needed the proper mix of programming to make the system attractive to consumers. The system they created was unique at the time, a first in the world. The wisdom of their decisions is borne out by the fact that even as fast as technology has changed in the past four years, the system with adaptations remains on the leading edge of technology. The original concept remains and the arrival of digital transmission schemes is readily adaptable to the evolution of technology here.

"I have tremendous respect for the people who conceived and built SKY from paper to reality."

CTD: Do you envision changes in the present stockholders of SKY?

FELLET: "Bell Atlantic and Ameritech have always had the right to sell down (reduce) their participation in SKY; I believe they have agreed the first call on any shares they might wish to dispose of would go to Telecom. That could happen (in the next 12 months) but that is a shareholder issue, not a management issue."

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LAUNCHING AN INDUSTRY

SCS '94 REPORT

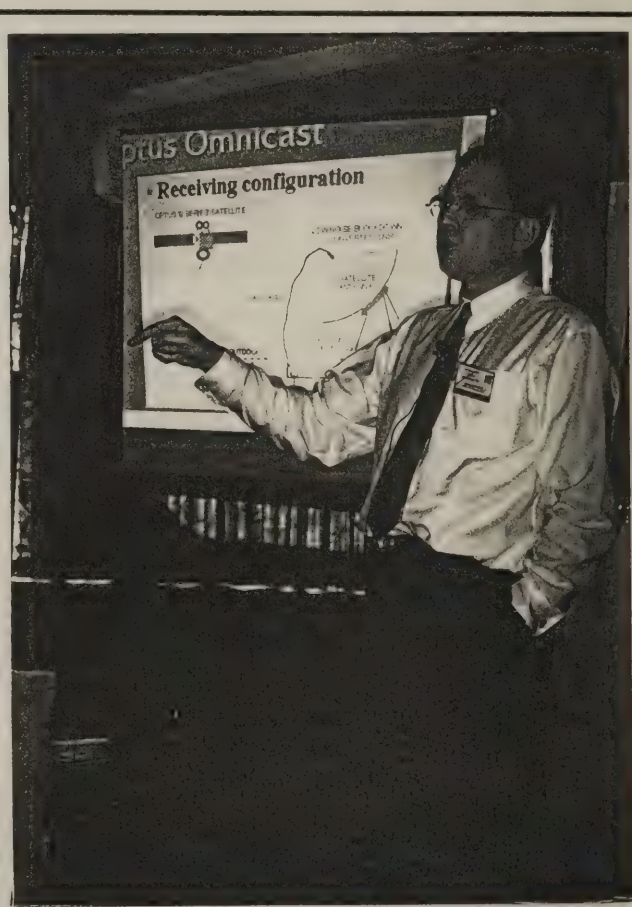
Three Days of Intensive Learning

Two hundred and four attendees made the trip to the Angus Inn in Hastings for the first-ever satellite and cable industry trade show in the history of the South Pacific. Most of these enthusiasts arrived on Wednesday September 14 during the afternoon hours and were rewarded by being participants or observers as satellite dishes went from cartons to pictures. Dishes as large as 3.7 metres, as small as 1.2 metres were constructed and installed on an upper balcony of the Angus only steps outside of the jam-packed exhibit hall. Virtually every attendee had the opportunity, during the three day period, to personally 'have a play' with one or more dishes, learning how they went together and more importantly how you actually locate a tiny dot in the sky that transmits pictures to your earth bound reflector.

SCS '94 attracted a wide range of attendees; from apprentice aerialists with a smattering of practical terrestrial antenna experience to Roger Keen of KM Electronics in Timaru who has over



SEEN THROUGH 3.7m MESH, TISCO's MANSON hands feed to Robin Colquhoun (centre), Barry Ward (right)



OPTUS NZ Manager John Humphrey details B1, B3 offerings for New Zealand users

the past ten years personally engineered and installed more than 100 dish systems for commercial customers largely on South Island (averaging nearly one per month in that period; a time during which most people thought there was NO satellite dish industry in New Zealand!). SCS '94 also attracted so many commercial exhibits from would-be suppliers to the industry that the designated exhibit hall area overfilled, flowing into the lecture hall as the September 14th set-up day came to a close. Some of the highlights follow.

◆ First SCS satellite signals. A 3.7 metre Orbitron screen mesh satellite dish supplied by TISCO began to go together at 2PM September 14th. The crowd of interested attendees watching the assembly put the skills of TISCO's Barry Ward and Graeme Manson and satellite consultant Robin Colquhoun under the microscope; more than 100 pairs of eyes intently studying their every move until Ward connected the last cables and displayed Intelsat 508 signals at 6:40 PM.

◆ Locating three new satellites. Although Barry Ward 'spotted' three mysterious C band satellites in the 140 east region with his AVCOM PSA-35 spectrum analyser connected to the Orbitron 3.7 metre dish before actual pictures appeared on the exhibit hall monitor from the Orbitron dish, Selwyn Cathcart of Telsat led a group of volunteers using a much smaller 1.8 metre dish to locate and view transmissions being relayed from Moscow on a new Russian satellite at 142.5 east around 6PM on the 14th. The technical quality of the Russian satellite signals on the relatively small 1.8 metre dish caused a considerable stir in the crowd that associated quality satellite reception only with much larger dishes before the demonstration.

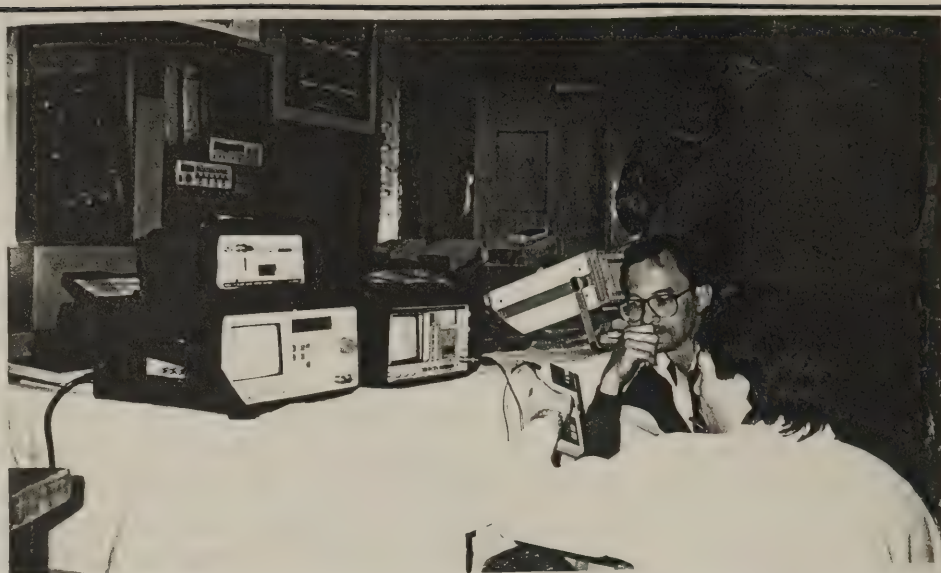
◆ High quality Optus signals. Through arrangements orchestrated by John Humphrey (Optus NZ manager) and Optus engineer Tony Hill, Australia's B1 satellite provided test signal proof during the day on September 15th that dishes as small as 0.9 metres will produce perfect quality home satellite dish pictures throughout New Zealand. The Optus test card signals were displayed on exhibit hall monitors with studio-quality colours on a dish which had taken less than 45 minutes to assemble from its shipping carton.

◆ TISCO's Tony Dunnett and Bob Ahrens arranged for special test transmissions from a new-to-the-Pacific region Russian built satellite located at 142.5 east and more than 20 hours of service from MUSLIM TV and Moscow 1 were received at the exhibit on dishes from 1.8 metres in size upwards. On the afternoon of September 16, Dunnett detailed the plans of several Russian satellite users who are promising entertainment



C-BAND PICTURES on 1.8m dish? All eyes are focused on the TV screen out of view at front of backyard-manageable dish.

quality television to the Pacific using satellites at 139.9, 142.5 and 145.0 east. During his talk Dunnett stood on stage with a telephone in his hand taking questions from attendees at SCS '94 and relaying them to the managing director of MUSLIM TV in London who told attendees his firm would like to provide three channels of television into New Zealand; one each full time Chinese, full-time Indian and one in



EVERYONE WANTS ONE - Gough Industries display booth featured spectrum analysers, some with built-in satellite TV receivers

English. The London operator of MUSLIM TV is expected on a New Zealand visit late in October to meet with people who have an interest in using his satellite capabilities for services into New Zealand; a direct result of the SCS '94 programme.

◆ Brian Oliver described the University of Auckland's scholastic research 7.3m satellite dish which was being assembled for its first public display on September 18. Oliver's recitation of the hundreds of individual approval steps the dish had to pass through within the University's bureaucracy was a study in 'Never Say Die' and the importance of keeping your end goal in view at all times. Nearly 8 years lapsed from the original concept of the University's use of a dish for international study purposes and its actual commissioning this month. The worth of the dish was already evident by September 23 when, while still in a test and check-out mode, it produced quality colour pictures from more than a dozen different satellites including Indonesia's Palapa B4 at 118 east; the first such pictures ever received from Palapa in New Zealand.

◆ Three seminar courses dealing with cable TV were surprisingly well received. Glyn Bostick, flying in from East Syracuse, New York to speak on 'Wireless Cable' captured the imagination of would-be entrepreneurs who quickly saw that cable TV, whether wired or wireless, could have many applications in New Zealand. Two additional cable TV seminars on the afternoon of September 16th attracted 43 individuals for post-seminar study materials being provided to them after the close of SCS '94. There will be a cable TV industry in New Zealand and the roots of that industry will be firmly wound around the seeds that were planted at this year's SCS. As an aside, by the weekend following SCS two attendees were already preparing cable system layout maps for their communities!

◆ Satellite system trade association. As early as the afternoon of September 15th, attendees were voicing the opinion that this new home dish industry should be organised from the outset with a strong, effective voice to the national and international community. During a session on September 16th, the proposal was floated and comments taken from attendees. From that humble beginning a small group of experienced satellite people have formed a committee to create a trade association for New Zealand sellers and installers of home dish systems. Serving on the committee

are Roger Keen of KM Electronics Ltd. (Timaru), Brian Oliver of the University of Auckland, Nigel Clough of Waikanae, Selwyn Cathcart of Telsat Communications Ltd. (Palmerston North) and CTD publisher Robert Cooper. The group will be working over the next 90 days to establish the framework for a trade association that fairly and equitably represents the long term interests of satellite system installers, system hardware suppliers and home and commercial system users. Trade associations from Europe and North America are being studied as models for the new organisation.

◆ New satellite industry trade publication. CTD's Cooper brought to SCS '94 a 'sample' issue of a new monthly trade publication called SatFACTS. 'SF' has been designed to focus solely on the development of the home and commercial satellite dish industry in the South Pacific and while the first issue was in a CTD-like 'newsletter' format, the publication is expected to adopt a bound-magazine format by the end of the first quarter in 1995. On the spot, 43% of those attending SCS '94 signed up for a one year's subscription and subsequent to the close of SCS the subscription list for SatFACTS is projected to hit the 200 mark by the date of the first 'regular' issue; October 15th. CTD subscribers note: All Coop's Technology Digest subscribers who are not already SatFACTS subscribers will receive a free sample copy of this new publication in mid-October. If you have an interest in the development of the satellite field, you are encouraged to subscribe from the form in that sample issue or from the form here in CTD.



HAVING A PLAY - Johann Zacher of Auckland tests his dish alignment skills using spectrum analyser on 1.2m



TISCO'S TONY DUNNETT explaining interest of MUSLIM TV to provide three 'in-clear' channels here

◆ Of the 204 SCS '94 attendees, more than half arrived with home VCRs in their luggage to enable them to videotape the 13 hours of specialised training materials transmitted through the master antenna systems at the Angus Inn as well as at the supplemental Hastings Motel facility. A special room at the Angus was established to allow those not staying at either the Angus or Hastings to tape the full compliment of materials; 18 attendees used this room's service and SCS '94 is especially grateful for the volunteer work done by Auckland's Johann Zacher and Zap Electronics' Jim Buchanan in preparing this taping room for operation.

Attendees voicing their opinion during the event or subsequently in the dozens of letters received have been universal in their belief that SCS '94 was good value, that it properly introduced new technology in a form which most could easily comprehend, and that planning for SCS '95 should begin now (!). The seminar system seemed to work well and aside from some lodging problems created by the intermixing of the three day SCS event with the immediate follow-on of the two-day ETSA event, it was a tremendous success for a first time effort. CTD as sponsor and host for the show is taking all comments received seriously and as the planning for the 1995 event becomes serious there will be significant opportunities for those who attended this year's pioneering event to make further suggestions. At this early stage, the target location for 1995 is within the Auckland area and the target period is in the middle to later half of November.

CTD is grateful to all of those many attendees and volunteers who individually contributed their time, energy, enthusiasm and expertise to make SCS '94 such a memorable and effective event. It is something of an understatement to suggest that there has never been a 'trade show' quite of the calibre of SCS '94 in the South Pacific previously and the special excitement that ran through the entire event will not be lost as the size and importance of future SCS gatherings grow. And finally, to satellite system engineers Nigel Clough and Selwyn Cathcart who created and ran the trio of 'Satellite Basics' sessions on September 15, our recognition that because of you two there are now some 200 trained individuals throughout New Zealand who will themselves train hundreds if indeed not thousands more on the finer points of satellite service reception. Good job.



ASSEMBLING 1.8m: Nigel Clough (left, front), Selwyn Cathcart (centre) as sun sets on 14th

SHOW STOPPERS!



AT SCS '94 several of our satellite TV course study books and affiliated products became instant best sellers. If you missed the opportunity to put any of these in your home library, here's a second chance!

- ☐ THE WORLD OF SATELLITE TV by Mark Long, Jeffrey Keating; the perfect quality first-level entry course to home satellite TV, 224 pages Latest edition, sells for nearly \$50 at Dick Smith. From Coop only \$35 postpaid (*)
- ☐ COOP's BASIC MANUAL on FINE TUNING PRIVATE SATELLITE TERMINALS. Post entry level serious guide to getting the most from a home satellite system. Only \$30 postpaid.
- ☐ COOP'S SATELLITE OPERATIONS MANUAL. Reveals the secrets of satellite transmissions in straight forward manner. A must for the serious enthusiast. Only \$30 postpaid.
- ☐ THE GIBSON SATELLITE NAVIGATOR MANUAL. A complete course in how to comprehend and duplicate Clarke Orbit belt satellite trackers for your dish systems. Nuts and bolts details. Only \$30 postpaid.
- ☐ ORDER BOTH COOPS plus GIBSON for special **\$10-OFF** price of \$80 postpaid!
- ☐ COOP's SatFACTS MONTHLY. This is a must-have publication for anyone who wants to get involved in the satellite TV industry. Timely, up-to-date facts about the satellites, the programmers, the equipment. 12 issues, \$40 postpaid.

ORDERING INSTRUCTIONS

Check-off the box for each item ordered. Fill in total amount here: \$. Note (*)/ We are taking orders now; first two shipments sold-out; next available around November 10!

YOUR NAME _____

COMPANY if applicable _____

ADDRESS _____

TOWN/CITY _____

- Check to Robert B. Cooper, PO Box 330, Mangonui, Far North

WE DID
THE DECENT
THING ...

WE GAVE
AWAY 13
HOURS.
FREE.

AT SCS '94 we arranged 13 hours of very exciting, very specialised satellite seminar training tapes; some of the greatest lectures, most informative programmes ever produced worldwide dealing with home satellite TV reception. All the basics from siting a dish to using a spectrum analyser. Every world pioneer worth remembering from England's Steve Birkill to South Carolina's Bob Coleman. Their actual talks, lots of video showing how its done, as it's done, around the globe. And we invited attendees to bring their own VCRs and to hookup to the motel MATV system and record approximately 4 hours per night. Free. To go home with the attendees for endless review, sharing, study. Well, our phone has rung off the hook. Dozens more want these 13 hours of priceless tape. So here we are up to our armpits in making tape dubs of these great programmes. *Now we warn you*, some of this tape footage is old, tired and not to broadcast specifications. But it is genuine, "you are there as it happens" footage shot when the pioneers created this industry. It's real, it's human, it's genuine. TISCO's Tony Dunnett told us he sat down to watch TVRO's Fifth Birthday (originally telecast in 1985 on an HBO transponder in America) *and he cried*. Imagine that: a grown man crying from the emotion of those pioneering moments.

Sorry, you supply your own tissue. You can order the full set of SCS '94 tapes on three VHS PAL format dubs direct from our masters for the postage paid price of \$130 in New Zealand; US \$130 elsewhere (and that includes Oz). Please allow two weeks for delivery; our tape machines are already running 18 hours per day making one dub at a time from the original masters.

-HOW TO ORDER THESE TIMELESS TAPES-

Complete this form, make out NZ\$130 (*) cheque to FAR NORTH CABLEVISION Limited and mail to address at bottom.

☐ GO AHEAD - MAKE MY MONTH. Send me the SCS '94 TVRO Training tapes.

NAME _____

COMPANY (if applicable) _____

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Cheque for \$130 postpaid to: Far North Cablevision, P.O. Box 330, Mangonui
New Zealand (*) - Outside NZ: in US\$)

TECHNOLOGY

BYTES

.....BITS AND BYTES YOU MAY HAVE MISSED IN THE RUSH TO MAKE A BUCK

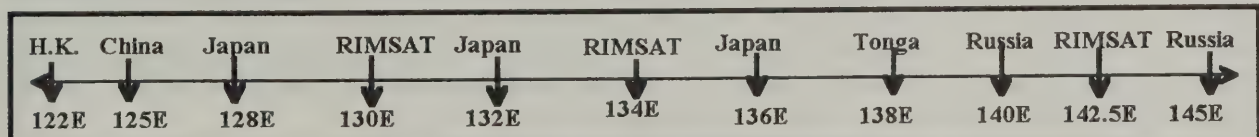
September 30, 1994 / ISSUE 94-09-11

SATELLITE TV

U.S. Direct Broadcast Satellite Corporation (DBSC) has asked the FCC to modify its scheduled orbital location and coverage region to include New Zealand. DBSC will launch a pair of high power digital transmission DBS satellites in 1998 using Martin Marietta satellites. The company had originally been granted permission to serve the North American market but with the head start of the Thomson/RCA/Hughes service now underway and the promise by Echostar of two competitive satellites for North America in 1996, DBSC has changed its business plan. They have requested permission to locate their twin satellites at 61.5 west and 175.0 west. The first satellite would cover much of Europe and Africa, all of South America while the 175 west satellite would reach virtually all of the Pacific Rim including New Zealand. The Ku band birds would serve DTH dishes in the 0.5 metre size with up to 150 channels of compressed, digital video service.

PanAmSat PAS-2 satellite (169 east) began regular commercial operation services on C band August 23 following satellite check out. To date regular ESPN (encrypted B-MAC in NTSC format) feeds, ABS-CBN (Philippines compressed digital format) service has been 'logged' along with non-identified NTSC format test cards (colour bars). Cynthia Dickens (PanAmSat Sydney office) advises CTD to expect additional regular service feeds "around October 1st." In particular, Hong Kong Telecom's new dedicated to PAS-2 uplink is scheduled into service at that time. A subscriber to ESPN Intelsat 180 B-MAC service advises "The ESPN feeds on PAS-2 are several dB stronger in Timaru than from Intelsat" characterising the pictures as "totally noise free." Other Kiwi observers, without the benefit of a B-MAC NTSC decoder, universally report "ESPN on PAS-2 is 1 to 2 'S-units' stronger on my receiver meter than CNN is from Intelsat at 180." Of various test carriers including test cards, Kiwi dishes with 3m range dishes report "no sparklies" (noise in picture) to "slight sparklie noise on the saturated blue portion of the bars." Bottom line: PAS-2 looks to be a fine satellite with great C-band service potential into New Zealand home style dishes in the 3m range; detailed observations appear in the October 15th issue of SatFACTS.

APSTAR vs. RIMSAT at 131/130 east continues to be 'talk' of the satellite trade. Two page report appearing in Time (International; pages 40-41; September 19) is very critical of (mainland) Chinese management for APSTAR which basically launched itself into orbit at 131 east position without respect to the existing satellites of Rimsat (130 east) and Japan (Sakura-3a at 132 east). All three satellites share at least some of the same 'footprint' region between India and Korea and absolute normal minimum between satellites sharing the same footprint(s) on the same downlink frequencies is 2 degree separation (i.e. 130, 132, 134 et al). There is an orbit registering procedure through the UN administered ITU; China's Apstar chose to ignore that process. The Chinese were perhaps purposefully vague about their intended orbit position of 131 before and immediately after APSTAR 1 was launched but when tests began in August from its self-assigned location immediate problems with Rimsat (130) and Sakura 3a (132) developed. Although APSTAR is a commercial satellite (customers include CNN, ESPN, Time-Warner HBO, MTV, TNT, British Reuters and Australia's Channel 9), the Chinese government controlled ownership kicked the Rimsat and Japanese violent objections to top level government department heads for the USA, China and Japan. After a series of fruitless meetings between the Japanese and Chinese, a Japanese space official told Time (magazine) "This has taught everyone a lesson. We realise that we have to prevent similar acts of bad behaviour." APSTAR customers planned to begin beaming out cable and direct to home broadcasts between October 1 and 15; Turner's TNT has



widely promoted an October 6th start, for example. That any of this will happen, of schedule or at all, is now highly unlikely. Meanwhile the US\$300M APSTAR 1 is basically a satellite without a home. The APSTAR problem is compounded by recent occupancy of virtually every other Asia-beam desirable orbit location (see reports to follow) and their own recent admission that December's scheduled launch of APSTAR 2 was intended to go to 134 east; a location already occupied by yet another Rimsat satellite.

Satellite programmers who have signed up for APSTAR 1 (and 2) are desperately searching for new ways to reach the Asian market in view of the APSTAR 1 orbital confrontation. Many of the programmers had decided to sign-up with APSTAR because with its Chinese government ownership, the programmers believed this would give them an 'entrance into China proper' for their programming. The orbit arc which is best positioned for pan-Asian reach (India to Korea) centres either side of 135 east. As the diagram (previous page, bottom) shows here, orbital parking space for new C-band satellites in this arc is already in use or spoken for through the ITU registration process. Going east beyond this arc-segment creates coverage problems into India; going west beyond the segment causes coverage problems into Korea and Japan. Programmers such as CNN want the widest possible coverage from a single satellite and they desire high look angle coverage (smaller dishes, pointing closer to 'straight up') to simplify receiving system design and reduce receiving system costs. PanAmSat PAS-2 at 169 east can 'see' as far west as the north-eastern edge of India but its on ground 'look angle' for even Malaysia is under 15 degrees. At these low angles, signal blockage from local trees and hills would prevent 100% coverage into the region for any PAS-2 user. Thus moving all of the troubled APSTAR 1 programmers over to PAS-2 and losing all of the Indian coverage is not a satisfactory solution. Finding a new home for APSTAR is another possibility; RIMSAT leases spaces from the Kingdom of Tonga at 130, 134, 138, 142.5. However, the further the satellite is relocated away from its intended 131 location, the more complex become the satellite pointing problems. The Hughes designed satellite has a transmit antenna pattern shaped to cover the intended India to Korea region from 131 east; this shaped pattern cannot be changed in space and any location more than 5 degrees away from the 131 design location will create new coverage problems on the ground. Bottom line: APSTAR 1 is in big trouble if it can't negotiate its way out of its self-proclaimed 131 location. And APSTAR 2 still scheduled for a December launch to 134 gets more tenuous by the day.

Russian sources will not admit they have increased the satellite activity at 140, 142.5 and 145 east because of the APSTAR fiasco, but most observers believe the Russians are making it very clear that APSTAR had better stay away from both Rimsat and Russian/CIS orbital spots. Rimsat, although a private US company, leases Russian satellites for 140 and 142.5. The 142.5 location, currently using an older satellite, is scheduled for a brand new Russian Express class satellite during the first 3 months of 1995. At 145 Russian either reactivated an older satellite or moved a new one to that location on September 16. New Zealand observers are now finding a mixture of Indian, Russian

-WHO WILL BE ON PanAmSat PAS-2?-

Although only test and encrypted signals have been seen from PAS-2 as of September 26, most observers believe the signal level that will eventually rain down on New Zealand from the first privately owned Pacific Ocean Region C-band satellite will support quality noise-free (above threshold) reception on dishes between 2.4 and 3m in size. The actual "*When will we start programming through PAS-2*" announcements will come one by one from each of the programme suppliers who have taken 'space' on PAS-2. From PanAmSat and other sources we now know that the following programme sources have signed up for transponder space and have since 1 September been paying PanAmSat for this space: (1) ABS-CBN, a Philippines based network that is already testing compressed digital (MPEG-1) format video on TR14. They plan to relay at least five TV programme channels to the southern Philippines where new cable TV systems are being constructed to use these feeds.; (2) Country Music Television (CMTV), a USA based 24 hour per day service; (3) Discovery, 24 hours per day, likely to start around 26 December from USA feed; (4) ESPN, already transmitting in temporary NTSC B-MAC on TR5; (5) KDD, a Japanese network with plans to distribute Japanese national programming throughout Asia and the Pacific; (6) Liberty/Prime International, possibly a compressed digital multi-programme feed from USA to new cable and MDS operators in Australia; (7) Turner Broadcasting, with CNN in free-to-air NTSC for sure, possibly also for TNT/Cartoon Network service fed from new Hong Kong Telecom uplink; (8) Viacom International, a USA programmer with movie channel services, MTV and a sporting channel possible; (9) NBC for its 24 hour business news network CNBC with likely start during October in analogue NTSC initially; (10) Trinity Broadcasting, U.S. 24 hour religious and family service with possible early 1995 start. Many observers are checking PAS-2 daily for new feeds and we will keep you advised here or through SatFACTS.

and a service calling itself MUSLIM Television scattered amongst the three locations. Most of the TV signals from these services vary from good quality to poor quality as the inclined orbit satellites move in a figure 8 pattern during the typical 12-18 hour broadcast day of these services. When the reception is good, the video is of noise free quality on even 3m size dishes in New Zealand.

University of Auckland 7.3 metre dish installation testing to our deadline has revealed that at least in the Auckland area signals from now ageing Indonesian Palapa B4 satellite (118 east) are strong enough for limited commercial use provided the system designer is skilful in his selection of dish feed and low threshold receivers. This 'bonus reception' was never seriously considered feasible when the University research system dish was in the planning stages. CTD visited the dish site on September 23 and found enthusiasm from University language department personnel very high; there is already talk of a second dish and a microwave link to distribute the received programming to other learning centres within the Auckland region. Schools throughout New Zealand have also contacted the University requesting information on sharing videotapes to be routinely made of non-English language transmissions. Further testing of the 7.3 metre system is underway as this issue is mailed; full details in the October 15th issue of SatFACTS.

OPTUS satellite B1 feeds were shuffled during September to provide temporary transponder space for the anticipated start-up of cable television and MDS oriented programming throughout at least the eastern Australia area as early as October. In the transponder shuffling, many of the original full (54 megahertz wide) transponders are now being redeployed in half-transponder (27 MHz wide) format. Observers in New Zealand are finding that transponder 5 half-transponder signals (12,470 MHz and 12,496 MHz centre frequencies) are received with above threshold levels on dishes 1.2 to 1.8 metres in size. This is a significant 'improvement' in picture quality from recent OPTUS service levels. Most of the programming seen to date has been of the news feed family.

PanAmSat (the company) has announced plans for its next generation of satellites which is being fast tracked for deployment by the end of 1996. PAS-3 goes into service over the Atlantic this November; PAS-4 is scheduled for Indian Ocean operation during 1995. The new announcement describes PAS-5 which is being built by Loral rather than Hughes which won the contracts for the first four. PAS-5 is to be a high power 100 watt per transponder C and Ku bird specifically designed for DTH (direct to home) broadcasting. They expect to locate PAS-5 over the Atlantic with all of South America within the shaped beam pattern. On the ground, the combination of high power and all digital transmission techniques will create as many as 225 DTH programme channels to dishes in the 24 to 26" (0.6m) range. PAS-5 is expected to distribute television programming in English, Portuguese and Spanish throughout South America. PAS-3's November launch will provide South America with its first DTH service, an interim package that PanAmSat reports is now 60% booked in advance of launch.

ESPN has signed an agreement with the North American National Hockey League that grants the sports channel exclusive international rights for cable and DTH through 1999. ESPN plans approximately 100 NHL games within its satellite programming feeds each year including Conference and Stanley Cup Finals.

Turner International has signed an agreement with Taiwan firm Videoland for the creation of Chinese subtitles to go out on TNT movie and TNT cartoon programming on TNT's new all-Asia service scheduled to launch from Hong Kong in October.

U.S. Direct TV all digital Ku band service that kicked off last June is now twice as big; successful launch, positioning and check-out of Hughes built DBS-2 satellite was complete in early September and it 'switched on' adding 75 additional digital TV service channels on September 19. DBS-1 and 2 fly at the 'same' orbital location, and their combined output is now 150 all digital, addressable, entertainment channels. On the ground, the availability of the US\$699-899 complete home receiving system packages has been a major problem. The first units released in five southern U.S. cities in June and July were sold out within hours of arriving at the stores. Some individual dealers in relatively small cities such as Jackson, Mississippi (population under 300,000) reported they were back ordered by money waving customers to more than 1,000 units (!). Thomson/RCA, the sole source for the first 1,000,000 units, doubled and then doubled again their Mexican production facility output to try to meet the demand. Sony has an agreement to be a second source for the receiving units and expects to be shipping by the second quarter of 1995. Of the 150 channel universe, the most popular and most watched programme channels have been 'packaged' into subscription sets with the least expensive 25 programme channels now selling to home DTH viewers for US\$21.95 per month; a 40 channel package is also available at US\$29.95 per month. The service is presently in MPEG-1 protocol format but will switch to MPEG-2 in January. The Thomson/RCA receivers will automatically switch to MPEG-2 as they are compatible with both versions of MPEG.

Direct TV competitor Primestar is not taking the growth of DBS-1 and 2 viewers without a fight. Primestar has been operational for several years but had made limited inroads because the satellites in use are lower power and require larger (1m) size dishes to produce quality pictures. DBS-1 and 2 are being sold to consumers with 0.5m dishes. Primestar recently completed converting all of its subscribers from analogue to digital receiving transcoders and passed the 100,000 subscriber mark late in August, and although previously sold only through local cable operators, is now being sold through retail outlets and chain stores as well in a test. One Las Vegas retailer sold out 170 of the 200 Primestar home packages he received within two weeks of kicking off a sales campaign. This is a mark DBS-1/2 are unlikely to match until sometime this month. Primestar is owned primarily by major cable television system operators including TCI which has a stake in SKY Network here in New Zealand.

DIGITAL TV AND RADIO

Thomson and France Telecom have given public demonstrations of their latest MPEG-2 compatible decoder unit designed for home satellite reception or cable TV headend use. The European package is a modification of the Thomson developed DSS Ku band 0.5m all digital system now underway in North America. European changes include PAL compatibility, 4:3 or 16:9 automatic aspect ratios. Like the U.S. DSS system, it is 'driven' by a Videocrypt based 'Smart Card' authorisation system. Variations of this package have been promised by a number of European Ku class satellite receiver manufacturers in the first quarter of 1995.

Consortium of British television broadcasters including ITV, Channel 4 and BBC have begun the first steps toward creating a transition plan that will convert all British television from its present analogue form to digital. The group has said that it will be at least guided by the final format adopted by other European broadcasters in their own switch to all digital TV broadcasting.

British Telecom has purchased Scientific Atlanta digital video compression systems for use within its 350 site U.K. business TV network.

Digital cable set-top transcoder boxes (to receive digital format programme services, transcoding them to analogue format for display on existing television receivers) are still not in more than a token delivery mode. The hardware suppliers now believe the extensive retooling for the new generation units will not be completely sorted out until June or July of 1995. The shortage of set-top units has put a severe damper on the rollout of digital services to date. The same basic 'guys' to be found in digital cable set-top converters will be used in digital satellite TV receivers as well and there the story is the same; mid 1995 before the hardware is available in any kind of quantity.

U.S. field testing of Advanced (digital) TV (ATV) has completed the initial testing phase with very positive technical reports. The field testing was conducted in and around the city of Charlotte, North Carolina where an ATV transmitter was operated in parallel with an existing high power analogue service. More than a dozen cable TV systems co-operated in the tests with the ATV signals carefully analysed at both off-air and through cable distributed sites; more than 200 in all. Using very critical measurement techniques, the consortium conducting the tests reports that 81.7% of all locations measured at off-air locations using ATV had 'satisfactory reception' against 39.6% for standard analogue NTSC. The ATV Task Force next meets October 3rd to plan phase-two testing during 1995. The goal is to approve the final system with the start of commercial ATV broadcasts in 1996; prior to the Atlanta (Georgia) World Olympics.

BBC is building its own band III (217.5 - 230 MHz) Digital Audio Broadcasting (DAB) transmitters to launch full-time digital radio in the UK by next September. The BBC service is likely to be the first-in-the-world DAB and has elected to use the Eureka-147 digital radio protocol. British chip manufacturer Enigma is presently working on VLSI chip designs for the new receivers that will be available when the regular broadcasting begins in the London area. The Eureka-147 protocol has not been popular in the U.S., where standards for DAB have yet to be adopted. The BBC is hoping that by pioneering the new service in the UK, it can help British industry convince other regions of the world that the Eureka-147 standard is the best protocol. On the line is export business amounting to billions of pounds sterling annually. The BBC claims it will have DAB available to 60% of the UK by the end of 1998.

Nikon and Fuji Photo will begin shipping a digital format still camera to dealers in April. The units use a 1,300,000 pixel 'card' as a storage medium and will take 'video snaps' like a camera with instant snap by snap playback on a TV monitor or TV receiver.

CONSUMER ELECTRONICS

Non-volatile flash memory packaged on cards similar in size and shape to standard credit cards are off and running and the new industry expects to sell 250,000 units this calendar year growing to more than 8,000,000 by

1998. The flashcard memory backers expect the system to find wide application in cellular telephone systems, handheld computers, and as 'film' in all-electronic cameras by the turn of the century.

A two-inch colour LCD television receiver with a list selling price of NZ\$260 has been introduced by Citizen. The units are being produced by China for Citizen, 20,000 per month are currently being shipped.

Casio has announced November availability of a 10"/254mm TV receiver that has a pop-up and down screen. When down the set becomes a projection TV system capable of filling screen sizes from 1524 to 2540mm. The 'Act Vision' system has a 10"/154mm base price of NZ\$2250; the 1524mm screen adds \$490 while the 2540mm screen adds 875. The base unit and 1524mm screen are available November; the larger screen in March.

Family heads faced with monitoring and controlling access to the family TV set(s) may find a new device from Synaptic Designs (Raleigh, NC) useful. Called 'Time Slot', the device allows up to 8 separate individuals to use a television receiver with each 'viewer' allocated specific viewing hours or a total of viewing hours per day/week/month. Each viewer/user has his or her own 'magnetic card' which must be inserted into the unit for the TV set to turn on. If the card's programmed time slot does not match the current time, the TV will not operate. Suggested retail price is NZ\$260.

Make your own CD's is the latest home electronics gadget from Pioneer. The technology for home-made CDs has been available for more than five years but debate concerning how users might be prevented from making perfect copies of other CDs in violation of copyrights has held the system off the market. Pioneer says it uses a 'Serial Copy Management System (SCMS) and price alone will probably initially keep the creation of customised CDs in the hands of studios and only the very affluent audiophiles; NZ\$6600 for the system, \$43 for 'blank' CD discs.

Japan's continuing problems with its own economy, and the high overhead associated with bringing new product concepts to the marketplace has been attacked directly by Hitachi. They call their new system 'DaVinci' and it takes selected new products out of the usual two to three year development cycle and fast-tracks them. Hitachi believes up to 15% of all of its consumer electronic business will be given the DaVinci treatment and a new camcorder product that interfaces with the TV set playback unit using infrared beams rather than wires is the first such product in the DaVinci stream. Getting products to market, faster and with less development cost, is the goal of the system.

High density CD (HDCD) format for the next generation of video CDs is expected to be announced at any time by project leader Philips. The first generation video CDs will be replaced by a newly created double-density system that packs more than twice as much information on the 5" disc. The major problem with the first generation standard hammered out by Philips and its backers has been the short playing time per CD; typically just over 75 minutes per CD. An equally difficult problem has been the lack of video quality, described by many as "less than VHS," especially with fast action events such as sports. The HDCD system expected will follow the now world standard MPEG-2 standard and reportedly will allow up to 135 minutes of recording time on a single side of a 5" CD. The expanded capacity is especially important to the movie producers who have until now showed little enthusiasm for a home system that required two discs for most movies and which lacked the quality of the VHS tape (as a reference standard). The present video CD system has attracted almost no software support although the unit's pricing has been reduced repeatedly to under NZ\$875 in some markets. The early indications are that HDCD will take at least two years to become a product in the consumer marketplace and even then at prices as much as 50% greater than the first generation equipment. That a second generation video CD can be in the marketplace for sufficient time before the first generation flash memory cards appear with MPEG-2 movie length contents the size of a present day credit card is a serious concern to the HDCD backers. Not all of the HDCD announcements will come from Philips; Sanyo will show its own version of HDCD at the Japan Electronics Fair October 4-8 in Tokyo promising to display a 135 minute movie on its players.

Samsung has backed away from a promised September delivery of a video CD player citing the "confused software market" for holding up the product. Video CD has been a less than overwhelming success world-wide since its introduction 12 months ago and faces a major overhaul of the recording and playback standards in 1995.

Taiwan Semiconductor Manufacturing Co. (TSMC) is being sued by game manufacturer Nintendo with claims the semiconductor firm is manufacturing pirate copies of proprietary chips owned by Nintendo. TSMC responds that they manufacture chips for customers who bring the chip design architecture to the firm for replication, that TSMC has no control over the chip's contents, after-manufacture uses nor marketing. Nintendo claims it has discovered TSMC manufactured chips that emulate Nintendo proprietary chips in no fewer than 9 countries across 3 continents. TSMC suggests Nintendo should bring suit against the firms who are selling the chips; it is only the contract manufacturer. TSMC is owned principally by Philips and the Taiwan government.

Picture tube shortage world-wide is resulting in an estimated 5,000,000 faceplates and/or 'funnels' being imported into the U.S. this year to meet the demand there. World-wide, Philips suggests the shortage is around 20,000,000 units with sizes above 20"/500mm especially tight. The industry believes the TV receiver market is growing at rates of between 8 and 25% per year by area with Asian set sales outpacing the balance of the world in growth. The hottest growth areas in TV receiver categories this year has been TV/VCR combos (up 50.3% from 1993) and projection TVs (up 38.1%).

Sharp has introduced a new microwave in the UK which it claims (we quote) "is a remedy for the British tendency to overcook food." Sharp believes that Britons as a culture decimate their food when cooking and has created a microwave unit that makes it more difficult for British housewives and househusbands to continue their ingrained habits. The new unit has an 'electronic nose' that 'smells' when food is done to the required level of cooking. In effect, the microwave has a 'feedback system' that sense when the food is properly cooked, and turns off the oven at that point. Whether Britons accustomed to overcooked food will adjust to the new level of 'less well done' food remains to be seen.

CABLE/FIBRE TV

Greymouth's PacSat Communications hybrid 12 GHz microwave plus cable innovative TV distribution system has become a model for 50% owner John Rutherford who CTD understands is now selling 'rights' to replicate the system throughout New Zealand. PacSat/Greymouth has been operating in an experimental or test mode since last February and each week new homes are connected to the system on a no-charge trial basis. Presently, CNNI from satellite, plus TV3 and CRY TV taped delayed one week from Christchurch are available to subscribers; TV1 and TV2 are not offered since both channels are well received by most viewers in the Greymouth area. Unlike traditional cable systems, Rutherford has imported surplus 12 GHz microwave from the U.S. and this equipment is being used in lieu of normal community-encircling master or trunk cabling. At the cable headend the channels to be distributed are connected to a 12 GHz ('CARS band') microwave transmitter. This unit then squirts signals to 12 GHz microwave receivers situated throughout the Greymouth region. Each receiver in turn feeds signals to the equivalent of a 'city block' through low cost RG-6/U type cable; the same type of cable aerial installers use for connecting rooftop aerials to in-home receivers, or motels use to distribute signals to rooms. PacSat Greymouth avoids the normal problems associated with running larger low loss cabling up and down streets, crossing over and under streets, and dealing with sometimes uncooperative councils. Within a block, PacSat extracts agreement from the property owners to utilise their fence lines, trees and sides of building to loop the small diameter cabling from home to home. Although the programming on PacSat Greymouth is marginal at best, the system has attracted considerable interest from other areas of New Zealand where would-be cable entrepreneurs are searching for techniques to bring additional programming channels to town. Greymouth partner Bernie Monk told CTD that "During September the patented PacSat system has been sold to other users for use in Auckland, Gore, Queenstown and Invercargill. We are also well down the road with a South African group that plans to use the (12 GHz microwave) system for distribution of educational programming in that country." The actual equipment patents are not held by Rutherford nor PacSat as the microwave equipment was produced a decade or more ago by Hughes Communications (and others) in the U.S. for use by cable TV operators there. The equipment available to date has been reconditioned by a San Diego refurbisher, and brought to New Zealand for resale. The 'creative' part of the system involves the use of low-cost Ku band home satellite antennas (from Taiwan and elsewhere) for the individual block-receiver packages. Again, Rutherford does not hold patents on that equipment either. Monk does claim that "We have a PacSat affiliated party now building equipment for us in Auckland" but he was not certain of the function of the Kiwi built units. Most likely this would be the standard VHF distribution amplifiers required within a block system to overcome cable losses in an area. The inexact nature of the actual patent-rights by Rutherford, who claims an Australian patent amongst others, has not stopped investors from queuing up to make use of the surplus equipment in other areas. Monk says "I expect the Gore system to be up and running shortly; the investor there has a long history in satellite dishes and other electronic fields and he is very keen to get going." Within Greymouth, Monk plans to come back and charge the homes now enjoying the free service \$125 for their original connection to the system, and then \$5 per week for the programming. He is hopeful, like many others, that new programming to be available from PanAmSat PAS-2 will allow him to not only increase the present channel load from three, but to also make it possible for the system to begin charging subscribers. "We have a bunch of money invested in this and we have pioneered a new system not only for New Zealand but for the world. I'm proud of what we have done to date. Six months ago PacSat

was a joke; not any more." He suggests those with an interest in exploring the system contact Keith McDonnell on 025-344436 or John Rutherford at 03-384-1059.

The Copyright Tribunal office in Wellington heard arguments from Kiwi Cable Company Limited and ESPN Incorporated on August 8th relating to the landmark case brought by Kiwi Cable against ESPN. Kiwi Cable seeks a decision from the Tribunal that the contract between ESPN and SKY Network is invalid under New Zealand law, and that ESPN should be required to allow Kiwi Cable to access ESPN programming either through SKY's UHF broadcast service or directly from the ESPN satellite feed(s). SKY is an interested party to the dispute but at this stage is not involved directly in the Tribunal hearing. The August 8th arguments from ESPN claimed that section 38 of the Copyright Act of 1962 is "limited" (in terms of section 36 of the Act) and further that because ESPN's encrypted satellite signals are not covered by the Act, Kiwi Cable has no 'standing' before the Tribunal. ESPN told the Tribunal on August 8th that because the signals are encrypted, they are not a public broadcast and therefore not subject to the provisions of the Act. As of September 27, the Tribunal had not reached a decision on this matter and a spokesperson for the Tribunal would not estimate when such a decision would be issued. The decision to come will not decide the issue; it is only a procedural hearing to determine whether the Tribunal has either the right or the obligation to hear the two sides of the dispute. If the Tribunal decides they do not have such rights, it is unclear what further action might be taken by Kiwi Cable. On the other hand, if the Tribunal decides they do have jurisdiction, then a date will be set for a formal hearing and at that time both sides will present their arguments.

American FCC still wrestling with the proper legal framework to allow U.S. telephone firms into the television distribution business. The FCC originally ruled in 1992 that telephone firms should be allowed to compete with cable TV "under specific circumstances;" those 'circumstances' have been debated for more than two years now. Under the present rules telephone firms anxious to deploy their ample excess fibre optic bandwidth may make federal application for permission to 'test' VDT / fibre optic cable TV distribution in limited geographic areas but may not offer full cable service

'LIVE TV' is the latest UK cable service announced. Owner/backers include U.S. firms Nynex, Southwestern Bell, US West (all telephone system owners), TCI and Comcast (cable system owners). The Mirror Group is the British partner.

Although women make up more than 52% of the world's population, the first all-women's cable TV channel has only recently been announced by cable firm TCI. Women's Sports Network was immediately followed by an announcement from American NBC network that they, too, are planning an all women's sporting programme service.

City owned cable TV system serving Amsterdam (Holland), Kabletelevisie Amsterdam (KTA), is being sold to private owners. The 400,000 subscriber system was a pioneer in municipally owned cable systems in Europe. The city reports the new demands for an all digital network and the considerable sums required to make the conversion from its present analogue format convinced it to get out of the cable TV business at this time.

TERRESTRIAL BROADCASTING

The Ministry of Commerce has made good on its promise to adopt new rules that allow 'UHF Boosters' or as SKY Network calls them 'Reflectors' to be constructed, operated and licensed by private individuals or groups of individuals (CTD: 9404, p.37). The new 'On-Channel Booster' rules allow the following:

1) The description of an 'On-Channel Booster' reads "(the) devices simply receive existing signals from the main distant transmitter and amplify these signals for retransmission to the pocket area."

2) It further notes "A typical booster will receive several channels simultaneously (say all three SKY channels and possibly Action TV) and retransmit these signals to pocket coverage at levels of less than 500 mw (milliwatts) per channel effective isotropic radiated power (eirp). Reasonable coverage can be achieved up to 1km from the booster in some circumstances."

3) "The Ministry will provide 'multi frequency licences under S.48 of the Radiocommunications Act for such devices under the following terms:

"A single licence with frequencies suitable to retransmit UHF services nominated by the applicant will be provided. Where the input signals are covered by two management rights (i.e. such as SKY, and, Action TV), two separate multi frequency licences will be required.

"Where VHF services are involved these will be covered by a separate radio apparatus licence until such time as the management right is recorded in the VHF television bands.

"Licensees will be required to ensure that the booster device does not cause interference on frequencies other than those specified on the license and to immediately cease operation and then filter the input/output signals prior to recommencing operation should such interference occur.

"The licence applicant must demonstrate on the application that there will be no interference to existing reception of the main signal from the proposed booster installation.

"Licences will be normally granted for a maximum term of five years.

"Licences will specify a maximum effective isotropic radiated power (eirp) of 0.5 watts per frequency.

"Applicants will be charged actual time and costs associated with the licensing function prior to issue of a booster licence. No payment for the spectrum resource utilised will be sought provided the coverage obtained is of little commercial value. Licensees will be required to pay regulation fees on an annual basis (presently \$45 per frequency listed on the licence).

"The RCL and MPIS choice will effectively give no protection of coverage quality to the (booster) licensee. The high dependence on siting installation details and input signal quality makes the engineering of such systems a complex task. Any interference either from direct coverage of the main signal or from other sources is not able to be accurately predicted by the Ministry.

"The Ministry reserves the right to create and issue other permanent licences which might interfere with coverage from 'booster' licences.

"The Ministry will advise the licence applicant, and the licensee(s) of the signals to be boosted, of the need to make appropriate commercial arrangements regarding program ownership and copyright, but it will be up to the parties concerned to finalise any agreement. Issue of a booster licence will not be conditional on such agreements."

Thus the planning, designing and licensing of 'on channel booster systems' for the extension of UHF (band IV and V) TV signals into pockets of population shadowed or isolated from direct reception by terrain and distance is now possible. Previously, the Ministry has licensed such devices on a one-off basis and the licence has always been held by the original broadcaster (see this issue, page 9 for comments of SKY's John Fellet concerning the ground breaking installation done at Te Kuiti earlier this year). CTD will describe the mechanics of such a 'legal system' in the next issue. Note that not all RFS offices may yet have full details on this new licence process and you may need to have them contact Wellington for details in granting your licence application.

In another similar action, the Ministry of Commerce has approved rules that allow private parties other than Television New Zealand and TV3 to own and operate licensed VHF 'translator' stations under certain circumstances. The issue arose earlier this year when TV aerialist Max Chapman responded to a request from a local pub owner who felt disadvantaged by not having Action TV race coverage available in his Timaru place of business. Chapman found a point nearby where Christchurch's CTV, which was carrying the Action TV racing, could be received. He built a translator unit that moved the CTV channel 48 signal to band III channel 5. He rebroadcast the signal on channel 5 and the pub owner had CTV plus horse racing to how. Two rules were broken: (1) The installation had no licence and Chapman was operating a television transmitter without permission; (2) Under the rules, neither Chapman nor CTV could be granted a license to transmit on VHF channel 5 since the VHF channels (1 to 11) were 'reserved' for use by Television New Zealand and TV3. Chapman found sympathetic ears at the Ministry of Commerce and rule changes were drafted to allow individuals or corporations other than Television New Zealand or TV3 to utilise unused VHF channels in areas where such use would not cause interference to existing VHF channel reception. Under the revised rules, others may do the same thing as Chapman, but be warned that your licence for use of a presently unused VHF channel will only be good until such time as Television New Zealand or TV3 can make valid cases for using that channel in your area. In other words, the licences can be cancelled on short notice and such cancellations will be without legal recourse. Again, your local RFS office may not be fully up to speed on this change yet.

During the SCS '94 gathering in Hastings a number of aerialist installers who maintain VHF translators for commercial customers suggested that one of the present needs in the New Zealand TV industry is in the area of low power VHF boosters and translators. One company that presently maintains 12 such units under contract pointed out that BCL has routinely been a source for 50 to 100 milliwatt output on channel VHF boosters through the years with the most recent delivered pricing in the NZ\$1400 range. Such units typically operate directly from a 12 volt DC source, are powered by a small rechargeable battery which is in turn connected to a light weight solar electricity panel. This allows the self contained on-channel boosters to be installed on a post or short tower, be completely removed from AC mains, and run unattended. Similarly, VHF translators (transposing the input channel to a new output channel) in a similar power range of up to 100 milliwatts at one time were available through BCL at pricing in

the \$2500-\$3000 range. No more, or at least not without considerable delays. One installer told us "As a practical matter, about half of these units that have been installed are licensed, and many of the on-channel boosters have never been licensed either by us or by BCL." Unfortunately, we were told, BCL has been less and less inclined to devote engineering time to such units in the last year and small pockets of people who could be served by such units are now going unserved. It is of interest to note here that Television New Zealand recently proposed to New Zealand On Air that if NZOA would fund them \$11,000,000 TVNZ would 'complete' its' coverage of New Zealand homes with TV1 and TV2 service. At \$1,500 a booster, \$11,000,000 would purchase 7,333 'on channel boosters' to help TVNZ complete its coverage of the country. The more immediate concern is to find someone within New Zealand who thinks \$1400-\$21500 is a fair price to build and deliver these 50 to 100 milliwatt on-channel VHF devices to installers such as we encountered in Hastings. If BCL has been installing these without bothering with a licence, perhaps that means others can also do so?

TV3 application for additional funding to serve west coast areas of South Island (CTD: 94-07, p.24) from New Zealand On Air has yet to be reached. NZOA told CTD "We expect this matter to be discussed for possible determination at our next meeting." This is scheduled for mid-October. One of the new proposals CTD has uncovered is a suggestion that where TV channel 1 is not a good selection (CTD: 9407, p. 25) that a new TV channel could be carved out of the region between the top of channel 3 (68MHz) and the bottom of the FM broadcasting band (88 MHz). A spokesman for the Ministry of Commerce advised us "That 209 MHz region has largely been vacated by the original amplitude modulated mobile radio users. There is significant airport safety use of the region a couple of megahertz either side of the 75 MHz frequency so that rules out using 68-75 MHz for a new channel. However, I believe on study that a TV channel could be created in perhaps the 81-88 MHz region and this could be substituted for television channel 1 in areas such as Greymouth where channel 1 is ill advised because of long range propagation interference potentials." CTD then checked with TV receiver distributors and found virtually all presently sold TV receivers will in fact tune to a new channel in the 81-88 MHz region and that older style sets with turn tuners could be readily adapted by field service personnel. NZOA told CTD "We have not heard this proposal from TV3 but will ask them about it at the next meeting." The use of channel 1 frequencies is being abandoned in most regions of the world and even Australia which has a similar assignment will terminate all but three of their (high powered) transmitters there over the next couple of years. This channel has previously been shunned by planners at BCL for locations along the western coasts of both islands because of the high percentage of the time that Australian TV stations using this frequency range 'skip' into New Zealand there.

Channel Fifty-One (P.O. Box 56163, Napier; tel. 06-844-9919) through Murray Sawyer, Managing Director, expects to begin local programming to the Hawkes Bay region at any time. This new UHF independent station says it will pattern its programming after the successful tourism TV oriented fare pioneered in Queenstown and Rotorua. The initial target audience is the motel operators in the Hawkes Bay region, hopeful that if the new channel can be included on the motel TV tuning dials the tourist staying there will tune in the programming and partake of the tourism activities which the station will be promoting. There is one serious glitch which Sawyer seems to have overlooked in his rush to get on the air. In his promotional material he wrote "Those accommodation houses who have installed SKY Television will automatically be able to receive the Channel Fifty One signal through the aerial at no extra cost. Those operators not intending to install SKY may receive our transmission by installing a UHF aerial." Well, not quite.

1) SKY installations do not distribute their UHF transmissions into motel/hotel rooms on the original UHF channels. Rather each SKY motel has special receiving equipment which first decodes the scrambled transmissions and then translates the incoming UHF channel to a VHF channel. This is almost mandatory since a majority of the TV sets in motels are not modern enough to receive UHF in the first place.

2) Installing a UHF aerial is of no value to a motel that (a) has TV sets that only tune VHF, and, (b) has a wired in-house cable system designed for only VHF.

Sawyer's failure to grasp these two important points may not be unique to him and other would be operators of UHF tourism channels or any UHF service channels are well advised to consider just how few of the television receivers in their prospective viewer homes or establishments can even tune in UHF at all. Pioneering UHF in any New Zealand market is going to continue to be a challenge for many years; putting a station on the air and programming it is only a partial answer to commercial success. Getting viewers to spend their money to equip themselves to receive these UHF transmissions is an equal if not greater challenge.

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